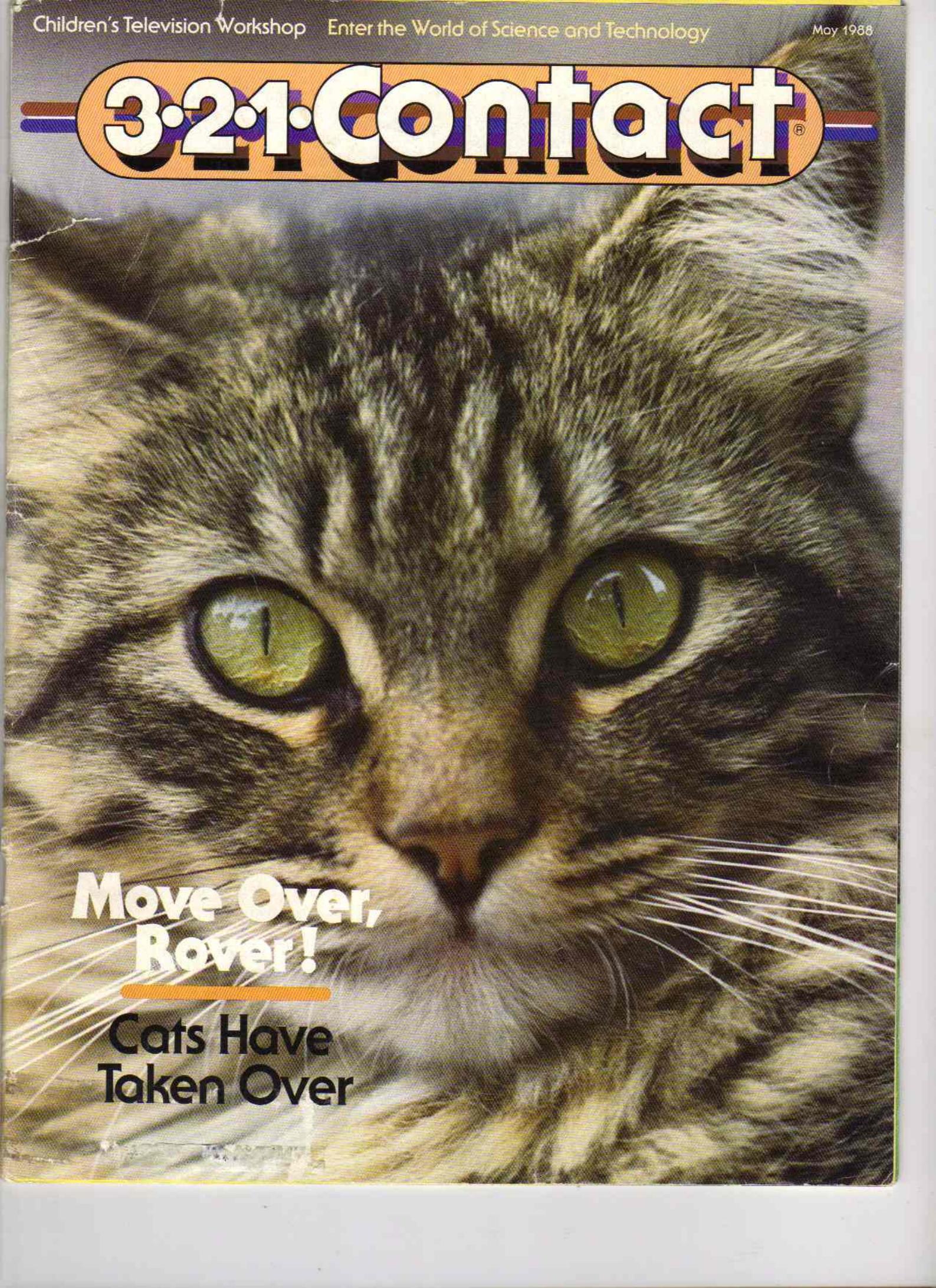


# 3·2·1·Contact®

A close-up photograph of a cat's face, focusing on its large, glowing green eyes. The cat has dark fur with prominent stripes. Its mouth is slightly open, showing its tongue and teeth. The lighting creates a dramatic effect, making the eyes glow.

**Move Over,  
Rover!**

**Cats Have  
Taken Over**

# Contact Lens

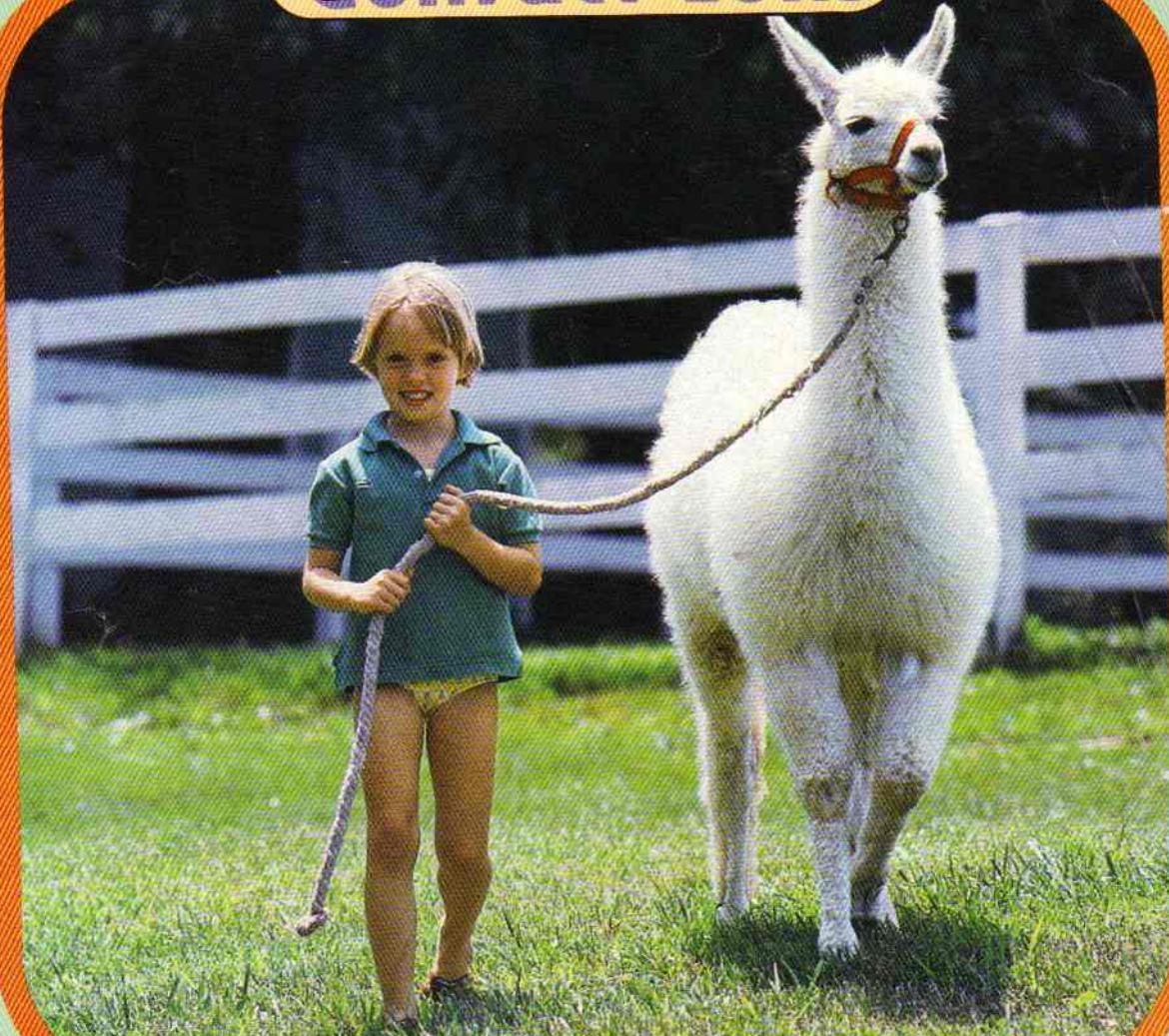


PHOTO: © SUSAN JONES/ANIMALS ANIMALS

## Lla-mania!

What's fuzzy, friendly, wears a pack full of camping gear and herds sheep? It's the llama—South America's answer to Lassie and Rin-Tin-Tin. Llamas are one of the hottest new pets around. In fact, there are more than 8,000 llamas in the United States.

Llamas come from the mountains of Peru, a nation in South America. The Inca Indians have used them to carry heavy loads for 5,000 years. Today, more and more people in the U.S. are taking llamas camping, keeping them on farms and even bringing them into their homes.

Why take a llama with you on the trail? Like its cousin, the camel, the llama is one tough critter. It can travel for days without

having to stop for food or water. It's also very sure-footed on narrow mountain trails.

Some farmers in Wyoming use llamas to help guard their flocks. Llamas are good at spotting coyotes and can sound the alarm to warn the sheep by yodeling. (Llama-yodeling sounds like a violin being tuned.)

Why would anyone want to keep a 400-pound llama in the house? Some people think llamas are cute. Others probably like the idea that they're such an unusual pet.

But llamas aren't for everyone. First of all, they can be very expensive. A first rate llama can cost more than \$7,000. More important: Llamas need room to graze. Most llamas live on ranches or farms.

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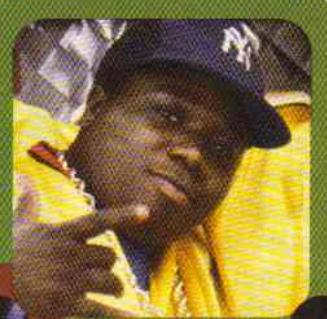
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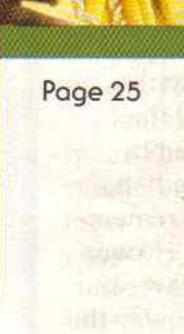
Page 18



Page 32



Page 10



Page 25



## Featuring This Month

**10** Sea Hunt: Life Aboard a Coast Guard Cutter

**14** Hysterical History: A CONTACT Computer Quiz

**18** Look Out Below! What's Happening Below City Streets

**20** Pipe Down! A CONTACT Poster

**32** Move Over Rover Cats Have Taken Over

## Square One TV Section

**25** Rappin' with the Fat Boys

**26** Mathnet

**28** What's Wrong with this Picture?

**29** Blackstone's Magic Page

**30** Which Button Should You Push Now?!!

**31** Find the Hidden Numbers

## Plus Our Regular Departments

**2** TNT

**4** Any Questions?

**6** Factoids

**22** The Bloodhound Gang

**34** Extra!

**36** Basic Training

**38** Reviews

**39** The Slipped Disk Show

**40** Did It!

Cover Photo: © Leverett Bradley 1985/  
FPG International

## Groucho Re-runs

People may be jogging differently in the future—and they may look a little weird doing it. At least that'll be the case if Thomas McMahon's idea catches on. Dr. McMahon is a professor of biology at Harvard University in Massachusetts.

The scientist came up with a new way of jogging called the Groucho run. It was named in honor of the famous comedian, Groucho Marx. (You may remember him from old movies. He was the guy with bushy eyebrows and a cigar. He often walked low to the ground.)

Dr. McMahon says that Groucho Marx lowered his pelvis and bent his knees when he walked. The professor says runners should use the same position because it lessens shock to the body. This should cause fewer injuries. And, McMahon says, Groucho runners use up to 50 percent more energy so they get a better workout.

What about athletic gear for the Groucho runner? Fake noses and bushy eyebrows, perhaps. But no cigars, please!



PHOTO © JOEL RIEMAN



## Racing the Sun

Vroooooommm!!!! On a two-lane highway in the middle of an Australian desert, 25 weird-shaped cars zipped by under the hot sun. The hot sun fueled the cars! It was the World Solar Challenge—the first international solar car race across a continent.

The long trip wasn't easy. Sometimes—near cities—the solar cars got stuck in traffic. And at night, with no sunlight to energize the cars, the drivers all pulled off the highway, pitched tents, and slept. Nevertheless, the win-

ning car, General Motors' Sunraycer, sped 1,950 miles in just five days. The lightweight car—it has bicycle wheels—averaged 43.5 miles an hour.

How does a solar car work? Solar cells—7,200 of them—cover Sunraycer's broad back. Those cells turn sunlight into electricity. And the car's thin tear-drop shape cuts through the wind, helping the car run fast with only a little power.

Most engineers, though, think that affordable solar cars are a long way away. Building Sunraycer cost \$8 million. Now that's a lot of sun dollars!

Story suggested by Timothy Murphy, No. Weymouth, MA.

ILLUSTRATION BY DEAN YEAGLE

## Big Eaters

Who eats the most canned spinach in the U.S.? People in Dallas, TX! Food sellers keep tabs on who buys what. Here are some more surprises: People in Pikeville, KY, drink the most Pepsi. People in Des Moines, IA, eat the most Jell-O!



## Green Spiders in Space

That's not the title of the latest horror movie—green spiders are common house plants. NASA—the U.S. Space agency—says they may also become part of a solution to air pollution. On future space flights, spaceships may be decked out with leafy green plants. They will clean the air.

Plants and trees play a big part in the Earth's air cycle. Plants take carbon dioxide out of the air and make oxygen, which animals and people need.

New research has shown that tiny openings on the surface of leaves also clean harmful chemicals from the air.

Then the plant changes the pollutants into harmless substances.



ILLUSTRATION BY MARY DUARTE

## Radio Reader

At this very moment, you're doing something that blind kids can't do: you're reading CONTACT. Most kids' magazines don't have versions printed in braille—a language for blind people made out of patterns of raised dots. But thanks to Aaron Weiss, 10, blind kids in Tucson, Arizona, got to hear CONTACT on the radio.

Aaron volunteered at Sun Sounds—a special radio station for the blind. Twenty-four hours a day, volunteers at Sun Sounds read everything from magazines to supermarket coupons—to help blind people know what's going on in their city—and the world.

Aaron read his favorite stories



from CONTACT: about Kanzi the chimp, UFO's, Sunshine the horse, the Mayans, and Any Questions? "It was the day before my birthday," Aaron told CONTACT. "This way I wasn't just getting something. I was giving too."

If you are interested in radio reading for blind people, write to:

**Sun Sounds of Arizona**  
3124 East Roosevelt  
Phoenix, Arizona 85008

## Whale of a Comeback

Killer whales, wild wolves, alarming alligators—that's probably not your list of favorite cuddly pets. But to a scientist, there is no such thing as a bad animal. It's great news, they say, that these three kinds of animals are making a comeback.

For the first time this century, the howl of wild wolves can be heard in some midwestern forests. And more killer whales have been spotted spouting off the west coast of the U.S. And at night, southern swamps are swimming with alligators.

Why are these animals doing better? For the past 20 years, the U.S. Fish and Wildlife Service has been cracking down on hunters who kill animals that are going extinct.

David Klinger of the Wildlife Service told CONTACT: "It's important to preserve all endangered animals."

The Whale Museum, in Friday Harbor, Washington, agrees. The museum has convinced over 6,000 people to adopt killer whales at \$20 each. The whales will stay in the ocean, of course. The money goes to scientists who are studying how to keep the huge creatures happy and, um, "whale."

## So What's New?

You tell us and you'll get a nifty CONTACT T-shirt—if we print your story. Send us any science stories from the news that you think our readers would like to know about. (Be sure to tell us where you heard the story.) Send to:

**TNT/3-2-1 CONTACT Magazine**  
**1 Lincoln Plaza**  
**New York, NY 10023**

# Any

# Questions?

by Mary Tota

## Why do your ears get clogged in an airplane?

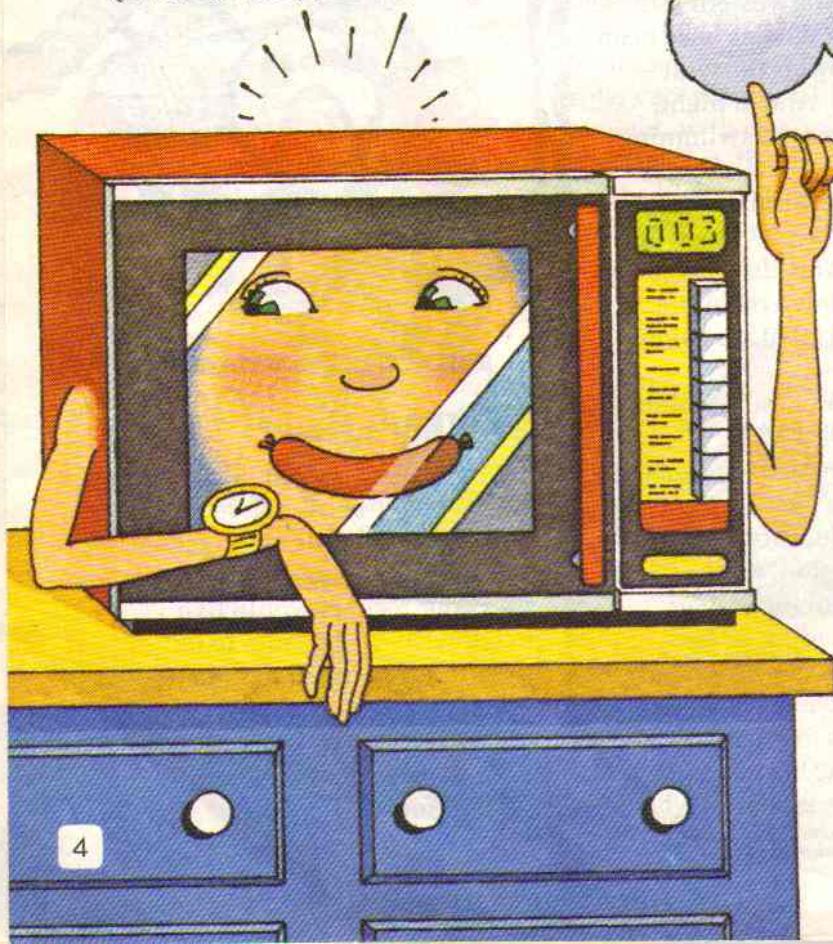
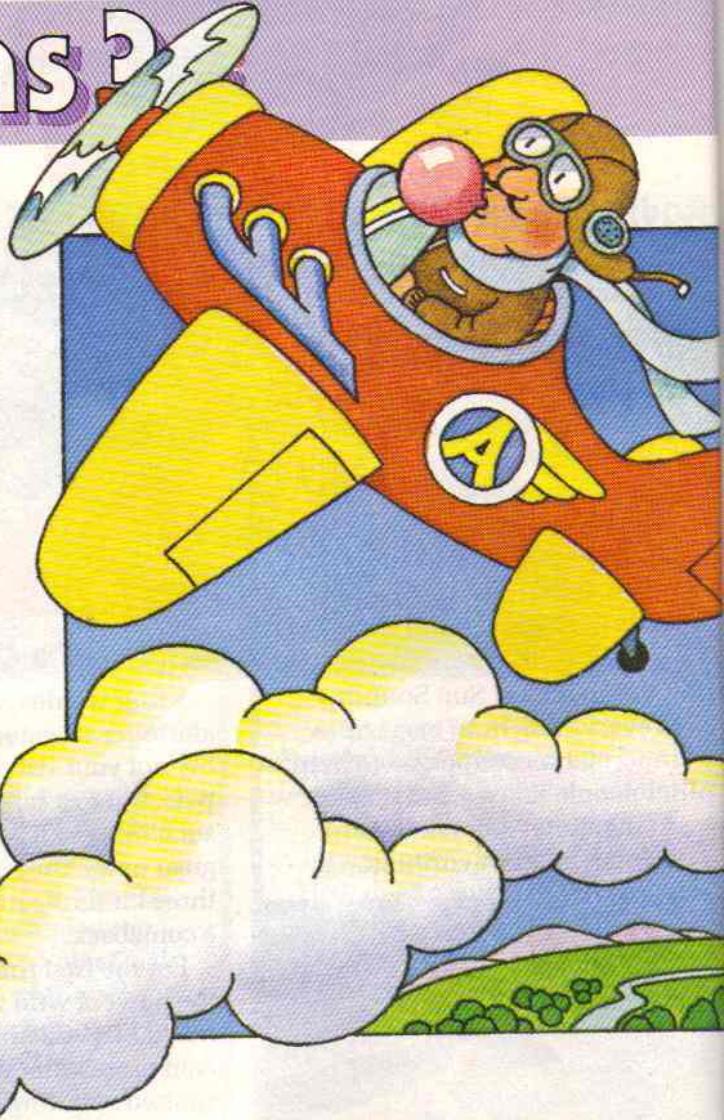
Even though you can't feel it, air is always pressing against you. At the same time, the air in your ears is pressing outward with the same force.

But in a plane, as you go higher and higher, there is less air outside to press on you. In other words, the air pressure gets lower. Meanwhile, the air pressure in your ears stays the same. This difference causes your ears to clog.

To help you get used to the change in air pressure, you have a special tube that passes from the ear down to your throat. This little tube adjusts the flow of air to your ear.

When you're in an airplane, though, your ears can't adjust fast enough to the quick climb or drop in altitude. Your ears may feel clogged, and they may even hurt. To solve the problem, try swallowing, yawning, or chewing gum. These all make the end of the special tube open. The air will escape, and your ears will feel fine.

Question sent in by Jamie Johnson, Houston, TX.



## How does a microwave oven work?

It would take 45 minutes to bake a potato in a regular oven. But a microwave oven can bake the same potato in three minutes. The speedy service of a microwave oven is the result of invisible waves called—you guessed it—microwaves.

The microwaves travel from inside the oven's machinery to your food. The water in the food absorbs the microwaves. This makes the water heat up. The heat travels to the surrounding food, which gets hot very quickly.

In a regular oven the cooking action is much slower. First the surface of the food heats up. Little by little, the heat travels to the center of the food. Finally, the potato is baked.

But in a microwave oven, the microwaves heat the water throughout the food all at once. So the potato gets cooked instantly—inside and out. How's that for fast food!

Question sent in by Tara Mandaillo, Westfield, NJ.

Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

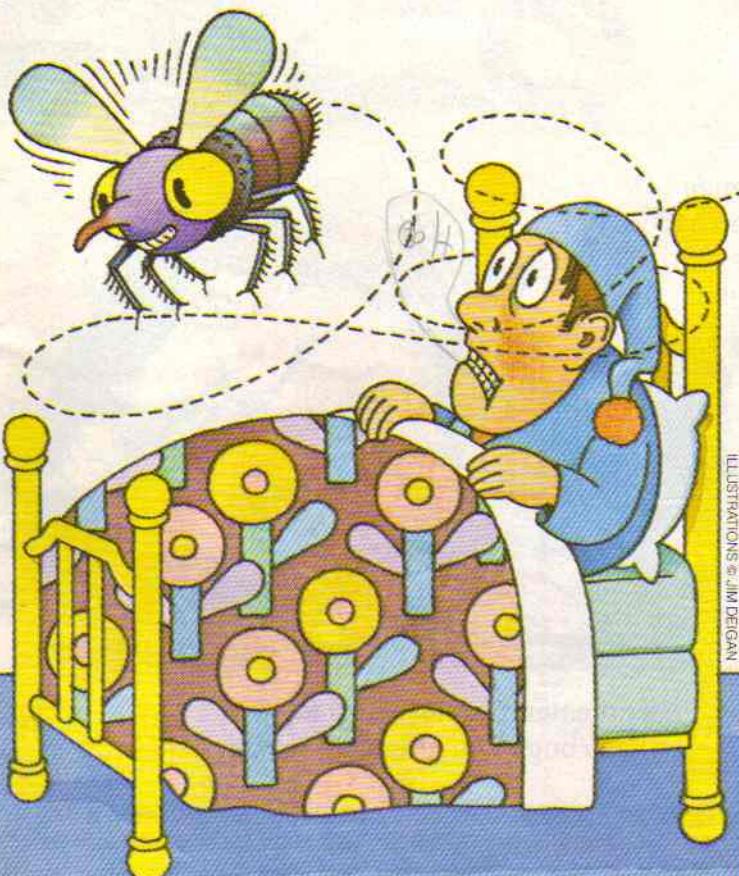
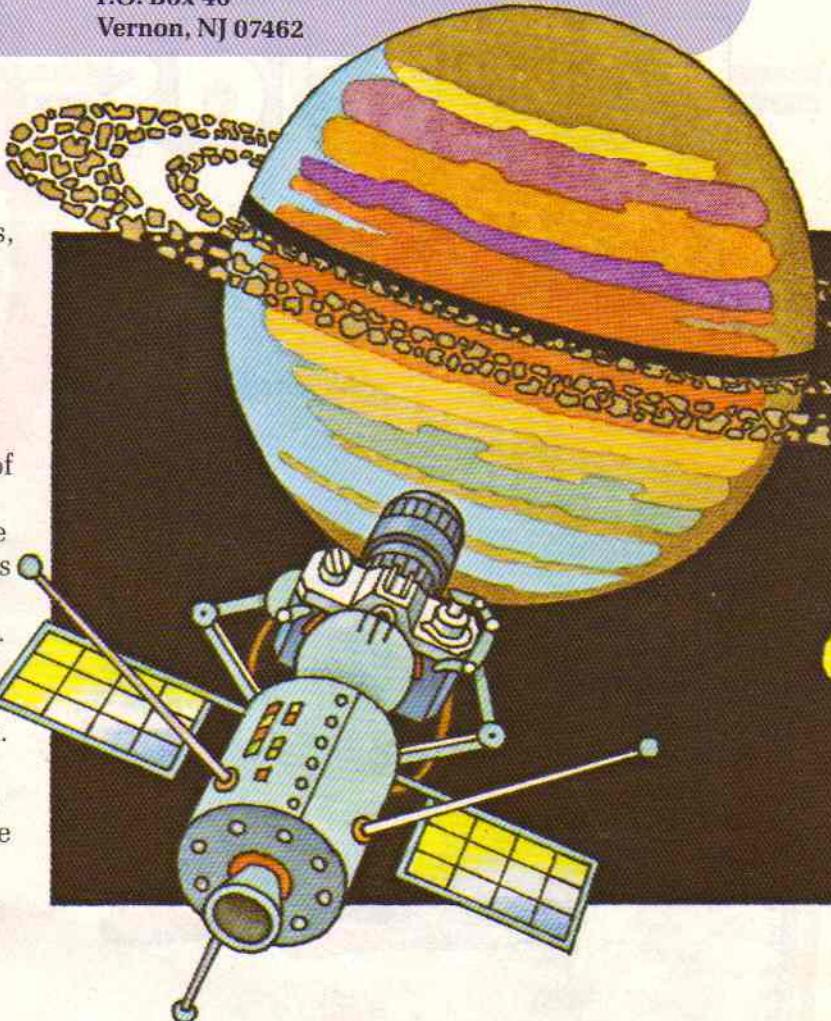
Any Questions?  
3-2-1 CONTACT  
P.O. Box 40  
Vernon, NJ 07462

## How did Saturn get its rings?

From earth, using the most powerful telescopes, astronomers can see four rings around Saturn. Without a telescope, you can't see the rings at all. To the eye, the planet looks like a star.

But when the spacecraft Voyager 1 reached Saturn in November 1981, it sent back pictures. Never before had Saturn been seen so clearly. The pictures showed that there are thousands of rings orbiting Saturn. They are made up of pieces of ice and ice-covered rocks. Some of the chunks are bigger than a house. Other bits are as tiny as grains of sand.

No one is really sure how Saturn got its rings. The rings might be material that never came together to form a moon. Or they might be the leftovers of a moon that once orbited the planet. Maybe the moon got too close to Saturn. The planet's gravity could have caused the moon to break apart. The pieces of the moon would have orbited the planet until they formed rings.  
Question sent in by Robin Carrol, Cardington, OH.



## Why do houseflies make a buzzing sound?

If you've ever tried to sleep with a fly in the room, you know how annoying that buzzing sound can be. But did you ever notice that a fly only buzzes when it's flying?

The buzzing noise made by a fly is actually the sound of its wings beating. The wings move so quickly—about 200 times a second—that their vibrations make the fly buzz.

You've probably also heard a mosquito buzzing before it took a sip of your blood. Just like flies, mosquitoes buzz because of their flapping wings.

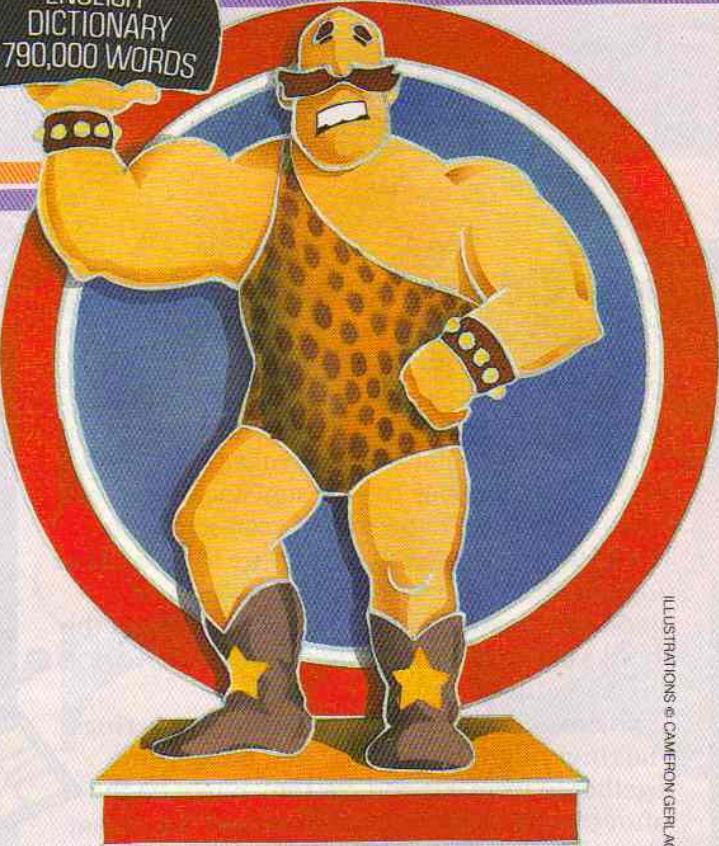
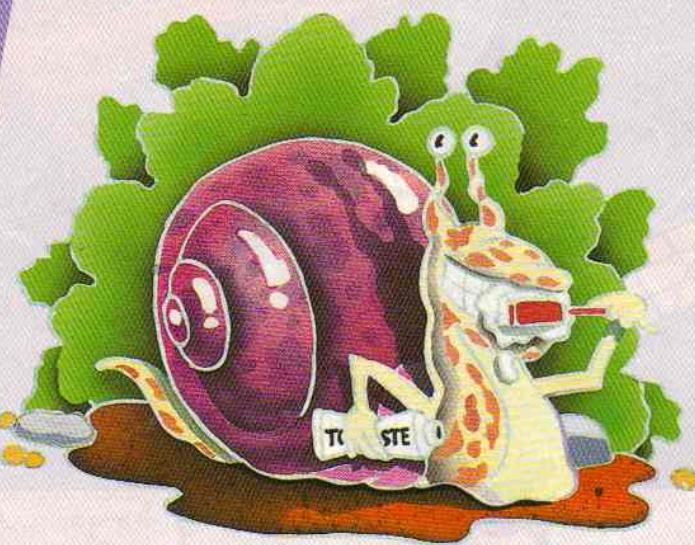
Bees are another example of buzzing insects. In fact, bumblebees are named for the sound they make. The word *bumble* comes from an old word that means *humming*. When bees flap their wings, a very loud buzzing sound is produced. Now that's a real hum-dinger!  
Question sent in by Ellen Moontsikaris, Boston, MA.

ILLUSTRATIONS © JIM DEGAN

ENGLISH  
DICTIONARY  
790,000 WORDS

# Factoids

Garden snails  
have 14,175  
teeth.



ILLUSTRATIONS © CAMERON GERLACH

The English language has  
about 790,000 words.  
That's more than  
any other language.



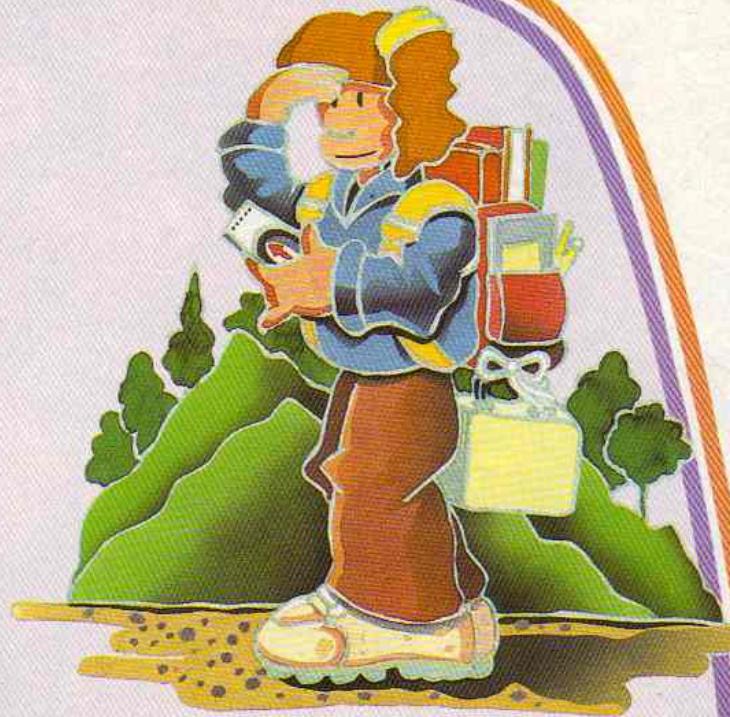
The average  
American eats  
263 eggs  
each year.



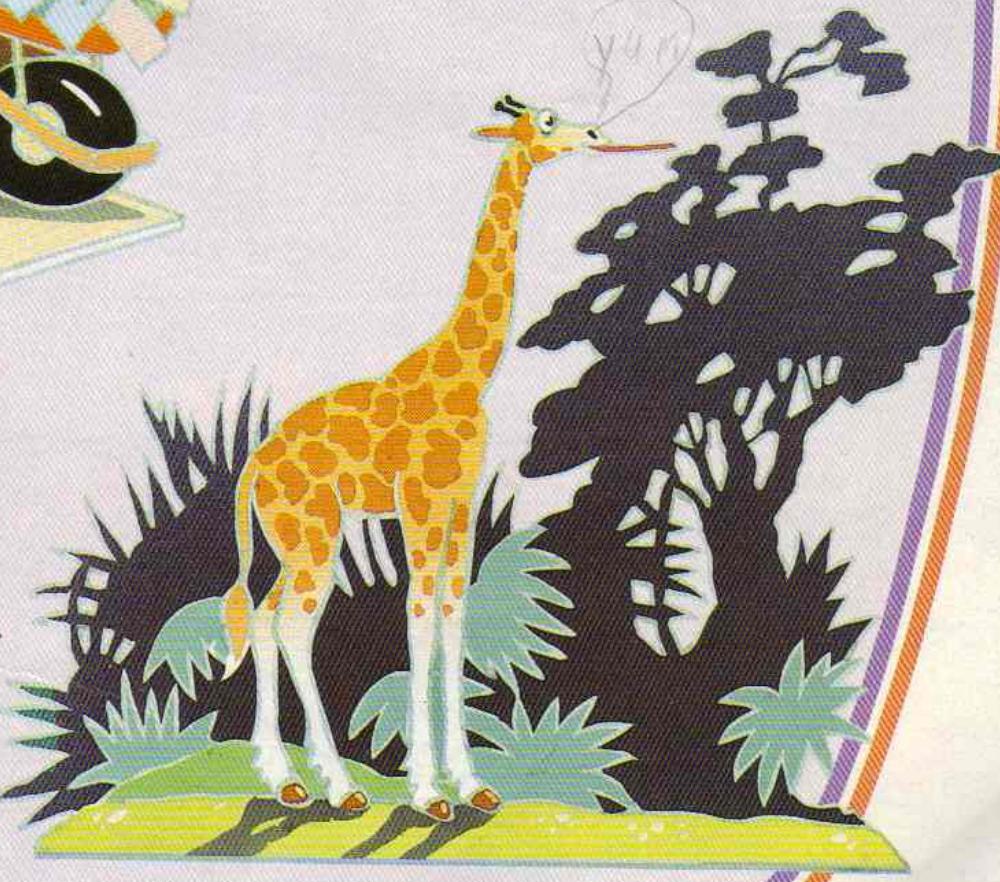
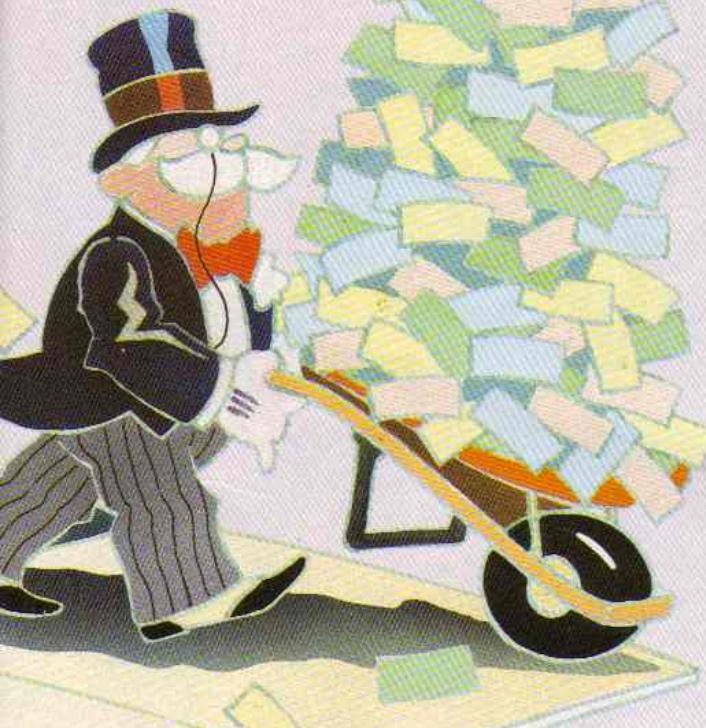
An anteater can close its nostrils  
to keep bugs from crawling up its nose.



More Monopoly money has been printed than all the real money ever printed by the U.S. government.

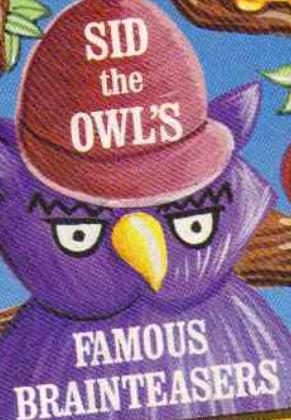


The average person travels  $5\frac{1}{2}$  miles to get to school.



A giraffe's tongue can be 17 inches long.

ADVERTISEMENT



The words in this square are the same across and down. We've given you some letters to get you started.

CLUES:

1. Tiny insects
2. Opposite of MESSY
3. Rhymes with RAKE
4. Connects the petals of a flower to its root.

1.	A	
2.		
3.	T	
4.		

Make Dull Places  
FUN PLACES - with  
**SUNKIST® FUN FRUITS®**  
REAL FRUIT SNACKS

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Anyone who sends in word games, etc., consents to their use and the use of his or her name in future issues of the magazine without further compensation.

Do you know any word games, brainteasers, jokes or dinosaur facts? Send them to Sid and Sam, along with your name, address and age to:

Fun Stuff/Dept. Z  
P.O. Box 40  
Vernon, N.J. 07462

## FUN PLACES TO EAT FUN FRUITS®

- After winning at Double Dutch jump rope.
- Rowing across a blue lagoon.
- Fishing for the Loch Ness Monster.
- Swinging on a tire swing.



**Smilin'  
Sam's  
Joke-O-Rama**

What's a  
teddy bear's  
favorite meal?

Thanks to Francesca Plath  
of North Hollywood, California.

## CRAZY WORDS

Unscramble these words to find out what makes a photographer click.

sghtil  
macera  
atcion  
cousf

9

7

## LETTERMANIA

The letters in the Tickle Tree are all mixed-up.  
Can you put them in the right order?  
Hint: We think you'll get this one in a flash.

## FACTOSAURUS

The giant stegosaurus (STEG-uh-sawr-us) was as long as a school bus. But its brain was no bigger than a walnut.

The brachiosaurus (BRAK-ee-uh-sawr-us) was the heaviest dinosaur. It weighed as much as 20 elephants.

The triceratops (try-SAIR-uh-tops) had three horns on its head. Two of the horns were over three feet long which helped to scare off all attackers.

S	T	I	E	M
T	A	H	E	R
N	E	A	T	O
A	N	T	S	R

Did the Owls Famous Brainteasers:  
fruits for dessert  
Smilin' Sam's Joke-O-Rama: Bear-b-que and animal fun  
Lettermania: CAMERA  
Crazy Words: lights, camera, action, focus

**ANSWERS:**



# SEA HUNT

**MEET CAPTAIN MARY MORRISSEY AND HER OCEAN RESCUE SQUAD**

by Ellen Rudolph Mednick

A woman stands on the deck of a ship sailing the waters off the coast of Florida. Another boat approaches. The woman picks up a bullhorn, and in a voice that can be heard hundreds of yards away, shouts: "Stop your vessel! Prepare to be boarded!"

The woman on deck is Mary Katherine Morrissey. A captain in the U.S. Coast Guard, she makes the dangerous decision to send her crew on a vessel that may be carrying illegal cargo.

Mary Morrissey, 24, commands the *Cape Gull*, a 90-foot cutter whose home port is Miami Beach, Florida. A cutter is a small boat that can move quickly through the water. The Coast Guard uses these vessels when help is needed—fast.

The Coast Guard station at Miami is the world's

busiest rescue base. The *Cape Gull* has been working that "beat" since it was built in 1953.

Mary and the 14 men and women on the *Cape Gull* do everything from rescue at sea to fighting fires aboard vessels. In a day's or night's work, they may tow a disabled boat to safety, pump out boats that are flooded, or save people whose vessels may be sinking.

Today, a big part of the *Cape Gull*'s job is to patrol coastal waters looking for drug smugglers. It's a lot like being police officers, but it's police work at sea.

## "Miami Vice" Patrol

One night not long ago, the crew of the *Cape Gull* was on their beat—tracking a freighter

suspected of carrying illegal drugs. The lights of the *Cape Gull* were dimmed, and the windows covered with black paper. This made the ship difficult to spot by smugglers. The seas were rough, and the *Cape Gull* was being pounded by waves. The ship trailed the suspicious freighter into calmer waters.

"When we were about 500 yards from the boat, we turned on the spotlights and identified ourselves," Mary said. "We saw that there were several small boats surrounding the large freighter. The illegal drugs were being loaded onto these smaller vessels."

Besides the *Cape Gull*, another Coast Guard cutter was called in on the mission. That boat cut in front of the freighter blocking its path.

"The minute we flipped on the sirens of *Cape Gull*, one of the smaller boats took off at full speed. We chased the smaller boat, while the other Coast Guard cutter stayed with the freighter," Mary recalls.

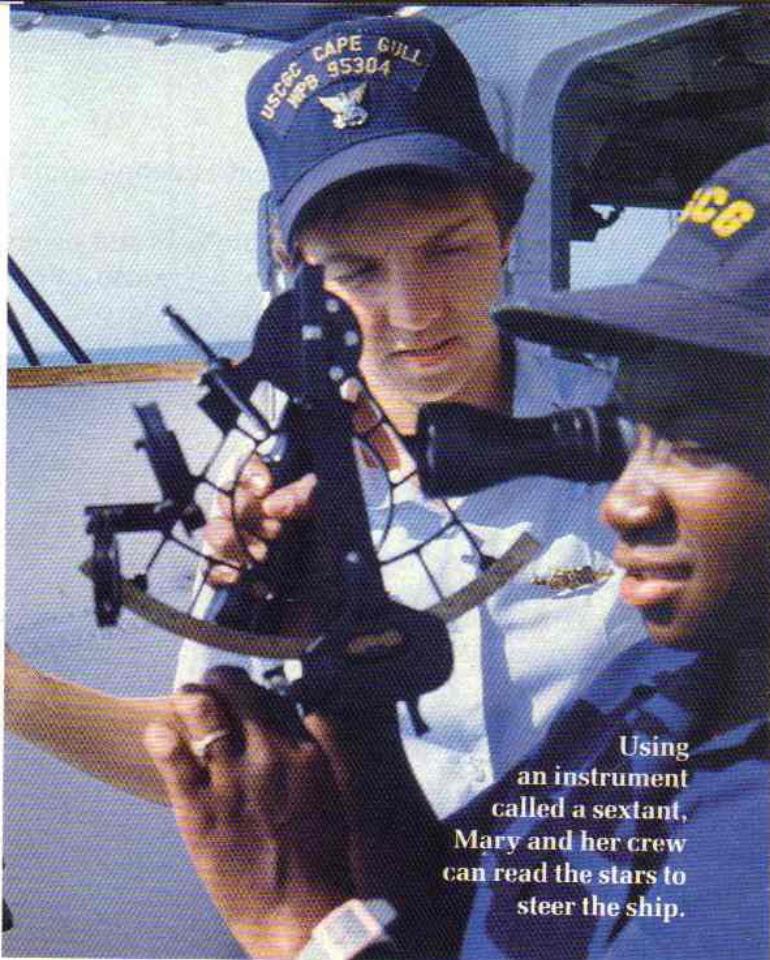
"There we were chasing this small lobster boat, which was going full speed ahead—straight into a reef. We came alongside the boat, jumped aboard and took over the controls. We stopped it just before it reached the reef.

"No shots were ever fired. And what we seized was the largest marijuana haul of the year—175,000 pounds, plus 22 pounds of cocaine," Mary remembers.

### **"Home Sweet Home"**

For Mary and her crew, the *Cape Gull* is more than just an exciting place to work. It's also their home. Mary has a tiny cabin of her own. The rest

Using an instrument called a sextant, Mary and her crew can read the stars to steer the ship.



of the crew shares sleeping quarters, one for men and one for women. They sleep in narrow, triple-decker bunk beds. Everything is very small and cramped—from the tiny lockers where the crew keeps their personal belongings to the bathroom which the crew shares.

The galley, or kitchen, is the meeting place for everyone. It's stocked with all kinds of goodies, even fresh-baked chocolate-chip cookies. ➤

**The cramped galley is the crew's favorite meeting place.**

PHOTOS BY GARY L. STARKS, USCG



There are two tables which seat 14 people, plus a TV and a stereo.

The crew is like a family of brothers and sisters. "We don't always get along, but we're also quick to give each other pats on the back," Mary explained.

As the captain, Mary is in charge of everything. "The hard part is making decisions and taking responsibility for others. But I've learned to trust my crew. We work as a team," she says.

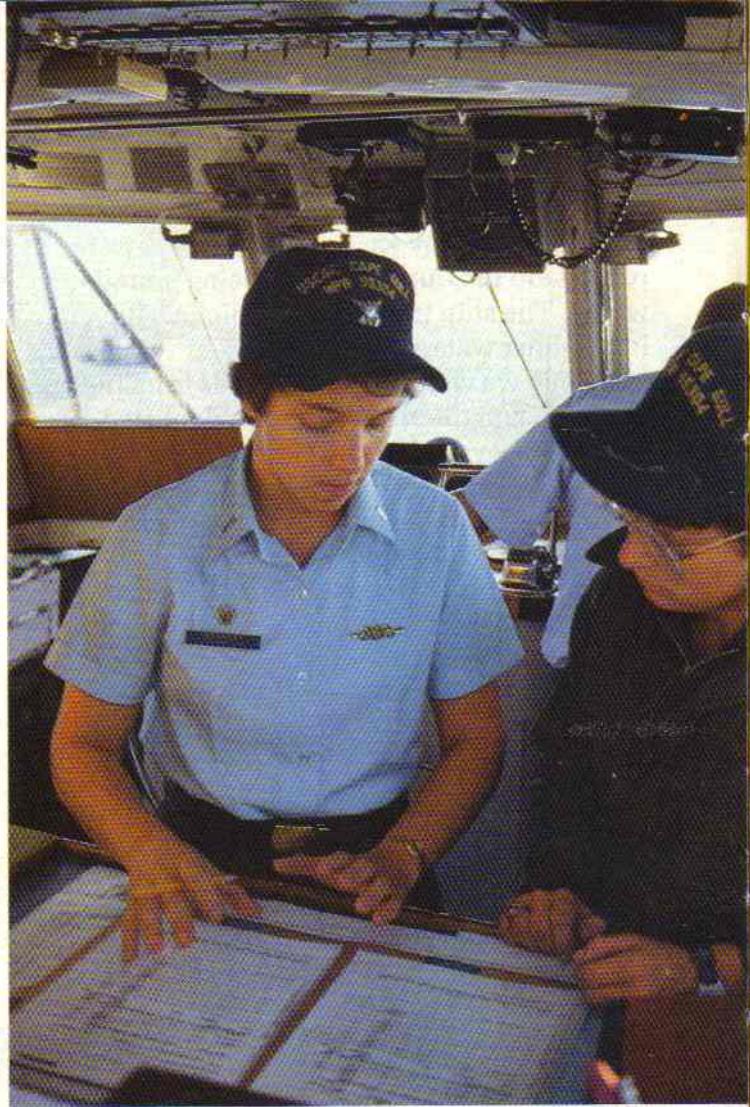
### A Family Affair

Mary has been sailing since she was a baby. "I can remember when I was very young and was out on our boat with my family. Suddenly, there were very rough waters and we had to head for shore. It was a very exciting experience."

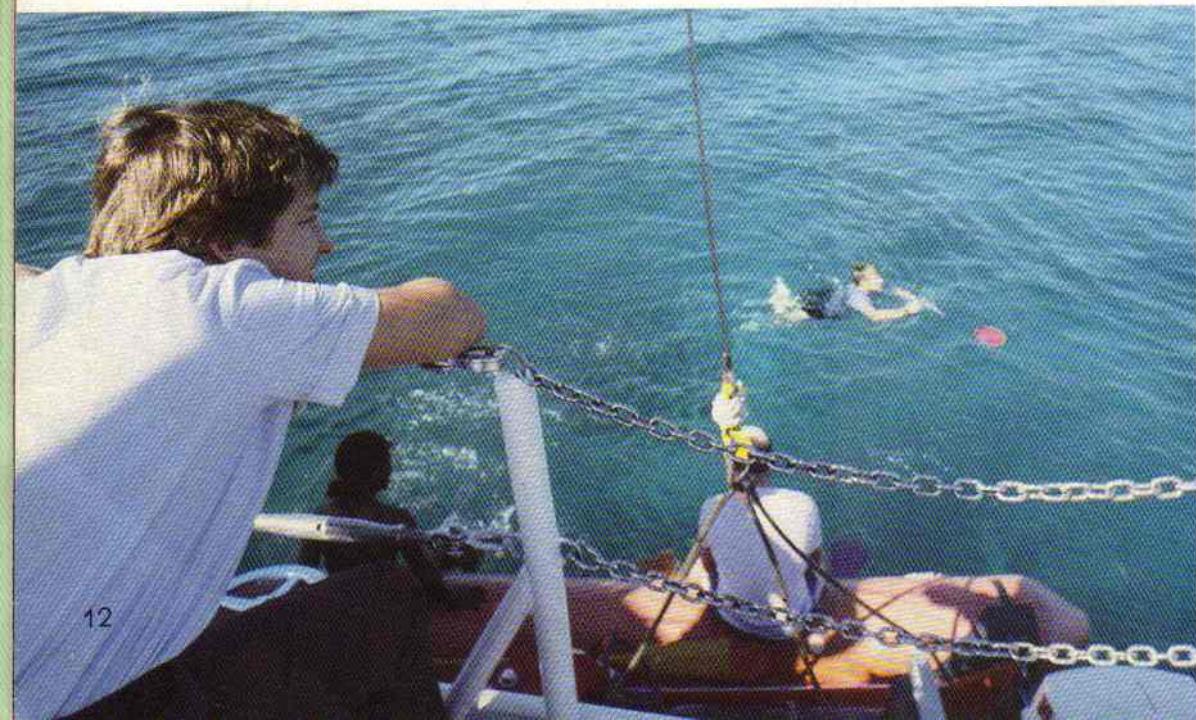
Mary's strongest subject in school was math. She loved to figure out problems and study maps. Science was her second favorite. "Each year, I'd come up with a great project for the science fair—but I never won!"

How did Mary Morrissey get to be captain of a ship? Well, it helps if you love the water. And believe it or not, science and math come in pretty handy, too!

Learning to steer a ship and chart a path are both based on angles and lines. So sailors need to understand science and math. To navigate or figure out exactly where you are, you can use a compass, a radio or satellite navigation. Sometimes sailors use an instrument called a sextant to steer by the sun or the stars. The sextant measures the



**Above:** It's very important to keep careful records while at sea. Part of the captain's job is to write up schedules and reports and to chart the ship's course.



**Left:** A "plus" of Coast Guard life: during a break at sea, the crew of the *Cape Gull* gets a chance to swim.

angle between the horizon and the star. By determining the angles you can find out just where you are.

Each day Mary uses science to give her the skills to run her ship. It's important to know about the weather, the currents, and how to "read" the stars and clouds. Without these skills, Mary and her crew could be lost at sea.

### Academy Rewards

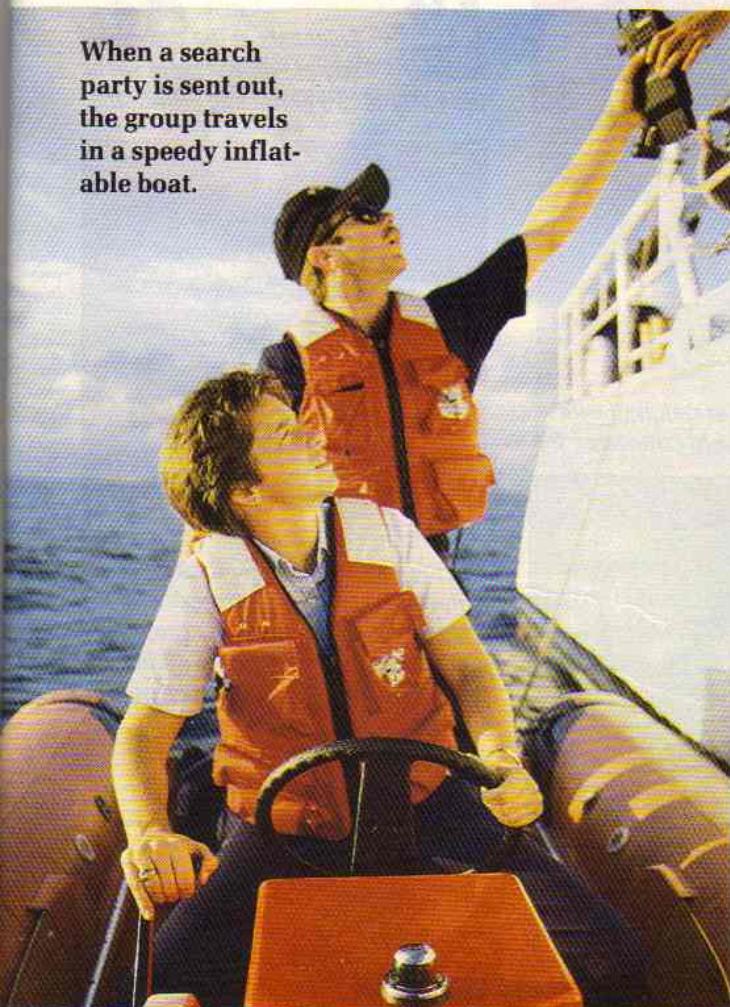
Mary grew up in Atlanta, Georgia, but since her family moved around a lot, she learned to make new friends easily. "My mom was always very independent and she helped to make me that way, too," Mary said.

That independent spirit and the ability to adjust to new places and new people, helped Mary out when she went to the Coast Guard Academy in New London, Connecticut. It's a college that trains officers for the Coast Guard.

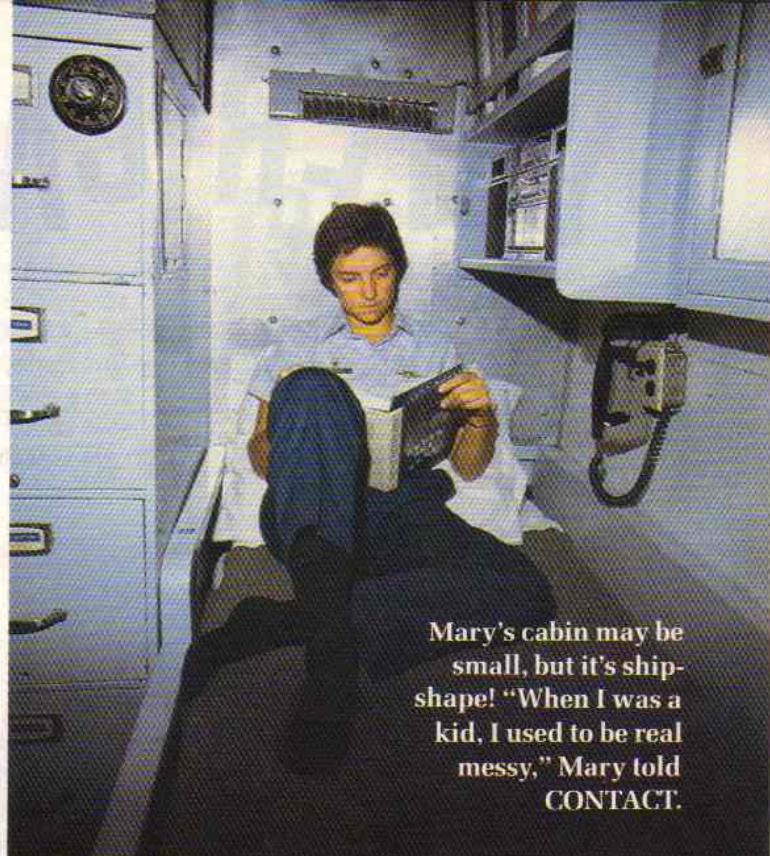
Academy life is very difficult. In class there's a heavy load of math, science and engineering. There's an emphasis on making your body strong to face the hard life at sea.

"But the best part of the Academy is that each summer I spent time on a Coast Guard cutter.

When a search party is sent out, the group travels in a speedy inflatable boat.



PHOTOS BY GARY L. SPARKS, USCG



Mary's cabin may be small, but it's shipshape! "When I was a kid, I used to be real messy," Mary told CONTACT.

I learned how to navigate and steer the boat. By the time I graduated I was ready to be a junior officer," Mary told us.

### Call Me Skipper

For two years, Capt. Morrissey served on the *Steadfast*, a 210-foot cutter. As her skills increased, she took on more and more jobs. Eventually, she was driving and steering the ship for the captain.

Today, Mary loves being the captain of her own ship. She will make it her career. Even if she marries and has kids, she'll still go back to the sea.

"My greatest thrill is ship handling—to drive the ship," Mary said.

On the *Cape Gull*, Mary usually leaves the driving to someone else. But when it's unusually difficult to steer the ship, Mary takes over.

"In early December, we had very strong winds blowing at 40 miles per hour. There were 12-to-14-foot seas. Visibility was one-half mile in heavy rain. And we had to tie the ship in at the dock," Mary remembers.

With hardly time to think, all the skills that Mary had gathered through her training came into action. She took over the helm and led the *Cape Gull* to safety.

Her crew went wild, cheering: "Good job, Skipper." And Mary added, "I didn't even scratch the paint!" ☀

# HYSTERICAL HISTORY

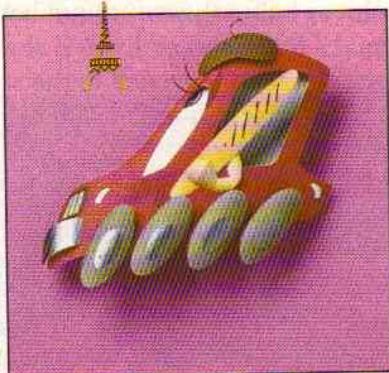
## A CONTACT COMPUTER QUIZ

By MEGAN STINE AND H. WILLIAM STINE

**I**t seems like there have always been computers, but electronic "brains" have only been around for about 40 years. How much do you know about the who's who and what's what of computer history? Take this quiz, then check the answers on the following pages. See if you can separate the silicon from the silly.

**1.**

In 1642, a French writer and philosopher named Blaise Pascal invented the first adding machine. It used eight wheels and a set of gears. In honor of his achievement:

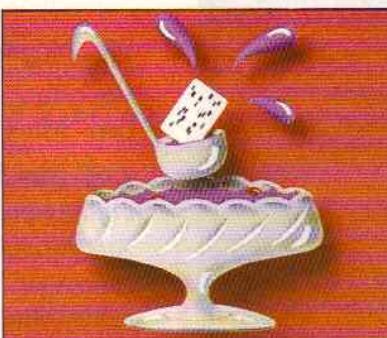


ILLUSTRATIONS © AJIN

- A. All French cars have eight wheels and a set of gears.
- B. A modern high-level computer language was named after him.
- C. An adding machine was named after him.
- D. The number 247,552 was named after him.

**2.**

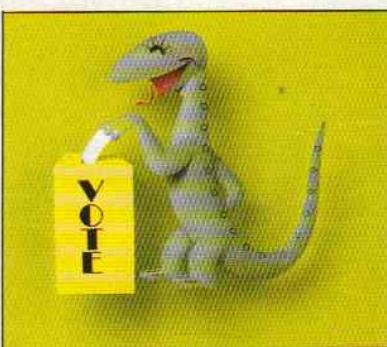
The forerunner of modern computers was invented in 1835 by English mathematician Charles Babbage. This machine used punch cards he borrowed from:



- A. His aunt.
- B. A punch bowl.
- C. A weaving machine.
- D. The library.

**3.**

Using Herman Hollerith's Punch Card Calculator, the

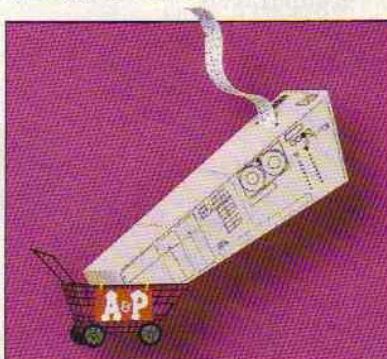


1890 U.S. Census was counted by machine rather than by hand for the first time. As a result:

- A. The Census Bureau completed its enormous counting task job in three years instead of nine years.
- B. U.S. Census employees got a six-year vacation.
- C. Herman Hollerith was elected to the Computer Hall of Fame.
- D. Census figures showed a million lizards of voting age in Iowa.

**4.**

Scientists at the University of Pennsylvania spent the early 1940's perfecting ENIAC, the



world's first all-electronic computer. But the glory went to their competitor, whose first product was the Mark I. This 50-foot-long computer could only add, subtract, multiply and divide. The company that built Mark I was:

- A. NBC.
- B. AT&T.
- C. IBM.
- D. A & P.

**5.**

In 1948, three scientists at Bell Labs—Walter Brattain, John Bardeen, and William Shockley—



came up with one of the century's most important inventions. In the 1950s, the Japanese used it to revolutionize radio. The invention was:

- Two all-beef patties, special sauce, lettuce, cheese, pickles, onions on a sesame seed bun.
- The transistor.
- The silicon chip.
- The joystick.

**6.**

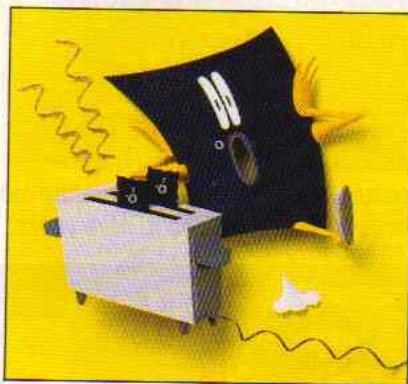
In 1951, the Remington Rand typewriter company made a big mark on the computer industry by introducing:

- DATAVAC, the first computer that could take its own dictation.
- CARPETVAC, the first computer that could handle ground-in dirt.
- UNIVAC, the first computer that could handle numbers and letters.
- HACKENSACK-ACK-ACK, the first computer built for Billy Joel.

**7.**

The real electronic revolution began in the 1960s, when computers got small. A computer with the power of huge early computers could now fit into a case not much larger than a toaster oven. The development which made this possible was:

- The toaster oven.
- The integrated circuit etched on a silicon chip.
- The disk drive.
- Laser holography.

**8.**

No color, no fancy graphics, and only two tiny



blips of sound—but in 1972, Pong arrived. Created by Nolan Bushnell, this was the first popular video arcade game. It helped Bushnell launch a company called:

- CTW.
- Commodore.
- Atari.
- Donkey Pong Industries.

**9.**

The first popular home computer had a home-grown name—the Apple II. It was introduced in 1977 by:



- The Thompson Twins.
- Steve Jobs and Steve Wozniak.
- Megan Stine and H. William Stine.
- Lisa Macintosh and Adam Osborne.

**10.**

In 1984, IBM announced a big breakthrough—the development of the 1000K RAM chip. With all that memory, you could:

- Become a world champion at Trivial Pursuit.
- Store a million characters, enough to write the next 200 quizzes.
- Write your name so many times it would stretch all the way to the moon.
- Do better on this quiz next time!

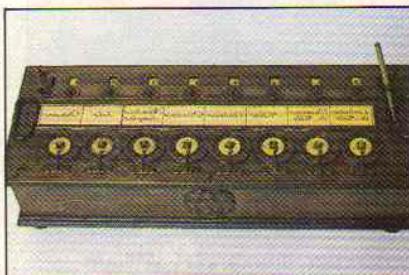


(Answers on next page)

# ANSWERS TO THE QUIZ

**1. B**

*A modern high-level computer language was named after him.*



COURTESY THE COMPUTER MUSEUM, BOSTON

*Pascaline: the first calculator.*

The computer language Pascal was named to honor Blaise Pascal for his contributions to mathematics and computers.

**2. C**

*A weaving machine.*



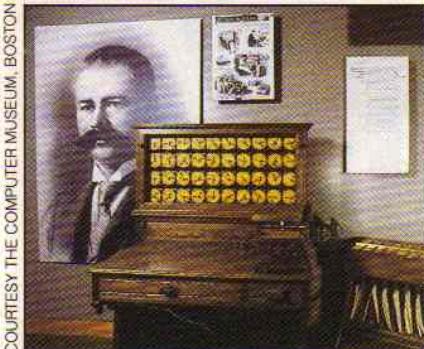
Babbage took a close look at the electrical weaving machine, and was impressed by the fact that hole-punched cards could be used to give it instructions. He decided to try and adapt the idea. Babbage believed his so-called "analytical engine" would be able to handle difficult math problems and "re-

member information" it had been given.

Babbage spent 40 years trying to perfect his machine. He never was able to create it—but the design of later computers owes much to Babbage's original ideas.

**3. A**

*The Census Bureau completed its enormous counting job in three years instead of nine years.*



COURTESY THE COMPUTER MUSEUM, BOSTON

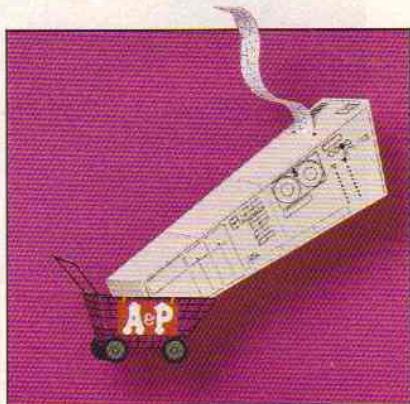
*Hollerith's counting machine.*

It took only three years to count the 1890 census. The 1880 census had taken nine years to count by hand. The U.S. Census Bureau had turned to help to Herman Hollerith and his punch card calculator (also known as Hollerith card). The company that manufactured Hollerith's machine went on to do pretty well for itself. It later merged with the company that became IBM!

**4. C**

*IBM.*

Weighing in at 5 tons(!), the Mark I was IBM's first "heavy"-weight computer. It was used until 1959.



Even though the Mark I was 50 feet long, it could have become the first desk-top computer—if only someone had invented the 50-foot desk!

**5. B**

*The transistor.*

The transistor not only revolutionized the radio business, it also made the first small computers possible. Before Brattain, Bardeen and Shockley invented the



COURTESY AT&T/BELL LABS

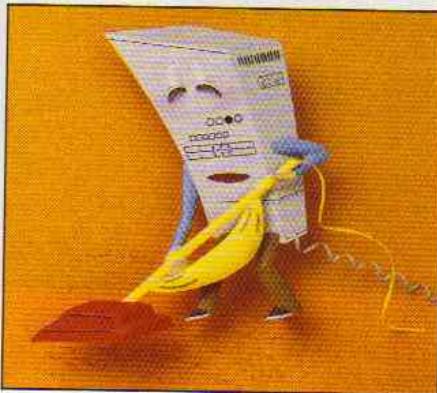
*Get small: the first transistor.*

transistor, huge computers like ENIAC needed 18,000 vacuum tubes to operate. Those tubes took up a lot of space, generated a lot of heat, and blew out about once every seven minutes.

## 6.C

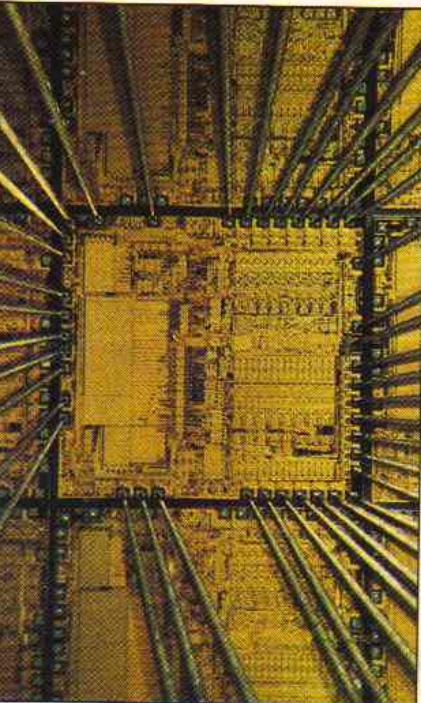
**UNIVAC**, the first computer that could handle numbers and letters.

UNIVAC was Remington Rand's entry into the computer market. Because it could handle letters as well as numbers, UNIVAC was the first computer able to "read" and count.



## 7.B

The integrated circuit etched on a silicon chip.



Get smaller: the silicon chip.

Computer technology had a big breakthrough in the 1960s with the development of silicon chips. It's possible to store and process an enormous amount of data on a chip the size of a caterpillar's mattress.

## 8.C

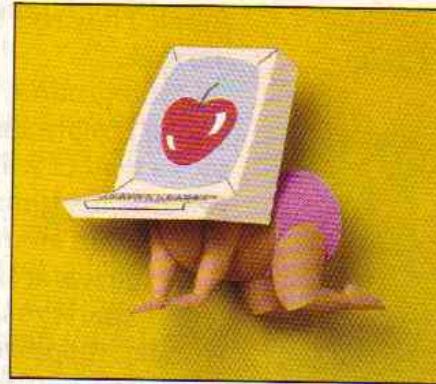
**Atari.**



Nolan Bushnell founded Atari and went on to become one of the first computer-geniuses-turned-millionaire. He later founded the Androbot robot company and Pizza Time Theatres.

## 9.B

**Steve Jobs and Steve Wozniak.**



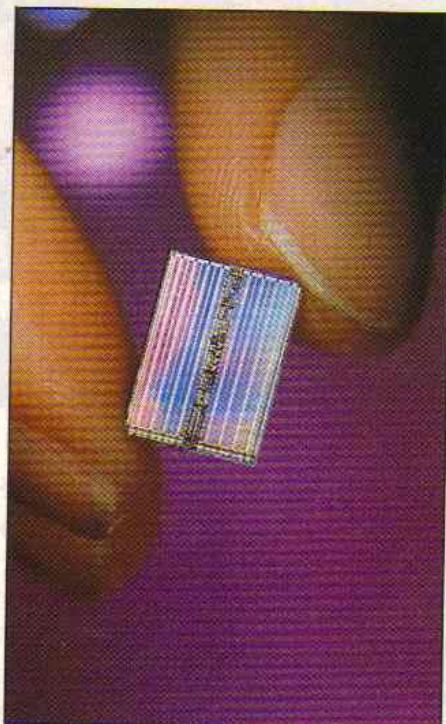
These two young men planted the seeds for the Apple computer while working in their Silicon Valley garage. The fruit of their labor was the first popular home computer. These two Steve's weren't satisfied to rest on their laurels. Steve Jobs went on to mastermind the Macintosh (named after his favorite variety of apple) and Steve Wozniak

ran a series of rock concerts called the US Festival.

## 10.A, B, C & D

**All of the above.**

100K is a lot of memory. Enough to help you become a champ at *Trivial Pursuits*, make up the next 200 quizzes, write your name so many times it would stretch to the moon and do better at this quiz next time.



COURTESY IBM

**Incredible memory: 1000K chip.**

## RATE YOURSELF

Give yourself 10 points for each correct answer, then check to see how you rate on historic dates.

**100:** An historical score!

**60-90:** Your HAM (Historic Access Memory) is well-done.

**30-50:** Your data on dates is deficient.

**0-20:** Do you remember where you left your toothbrush?



MEGAN STINE and H. WILLIAM STINE write books, quizzes and other strange articles on their Columbia computer, an IBM-PC compatible.

# Look Out Below!

## WHAT'S HAPPENING BELOW CITY STREETS

by Ira Wolfman

These workers are using video instructions to make repairs in a manhole.

9:35 A.M. New York City's Union Square is bustling. The streets are filled with people shopping and walking to work. Skateboarders dart among the benches of Union Square Park. Under their feet, deep below ground, noisy crowds have been streaming through the enormous subway station. Seven subway lines meet here.

At Wendy's Hamburgers on the square, Craig

McCoy, 21, is on a break. He is standing outside Wendy's when he feels the ground begin to shudder. "The next thing I knew the street cracked open," he told 3-2-1 CONTACT, "and then water burst out, really strong."

9:36 A.M. Four geysers of water gush into the street. They rise three feet into the air and flood the area.

Underground, a subway train is nearing the Union Square station. Suddenly, the driver sees a wall of water rushing through the tunnel towards his train. He and his passengers are stranded in an underground flood!

As the water filled the streets and subway tunnels, experts rushed to halt the damage. As they worked, more went wrong: Telephone lines went dead. The power company had to test gas lines for leaks to prevent explosions. Steam lines were shut down to prevent them from shattering if the cold flood waters reached them. Subway passengers had to be led to safety. Traffic on the street came to a dead halt—for miles.

What caused this disaster? "One of the three-foot-round water pipes—buried five feet below

Subway trains roar in and out of underground stations, whisking city people to work.



PHOTO © RICHARD LINDERS

the ground, but way above the subway—sprung a leak," explained Warren Neuberger, an engineer for the city.

### Maze Beneath Your Feet

This spectacular water pipe break spilled millions of gallons of water into Union Square and made life difficult for people in the neighborhood for nearly a month. It made New Yorkers realize how much they depend on their underground tangle of cables, pipes, and tunnels.

Exactly what is down there? Under the 6,000 miles of New York City streets, there are about:

- 78,000 miles of electrical wire
- 31 million miles of phone wires
- 4,000 miles of gas pipes
- 230 miles of subway tunnels
- 6,000 miles of water pipes
- 1,000 miles of sewers
- 50 miles of steam pipes

New York has the world's largest underground jumble, but every big city—and many small ones—have quite a traffic jam of pipes and cables beneath their streets. Think about what is buried underground in your town or neighborhood. There may not be subways but certainly there are sewers and drainpipes and water pipes, electrical lines and TV cables—maybe even some surprises like these:

### Workers Find Ship, Fight Gators?

Workers in New York were digging tunnels for a subway line when they stumbled upon the keel of an ancient ship. It turned out to be the Tyger, a Dutch ship that was one of the first ships to sail New York's waters. It burned and sank in 1614. Eventually it was buried under mud built out from the shore.

There is a wild story that alligators live in New York's underground tunnels. During the 1920's and 1930's there was a fad for ordering baby alligators from Florida for pets. Soon the alligators stopped being cute pets. What did New Yorkers do with all their extra alligators? Flushed them down toilets and into the sewers! Soon, the rumors started: alligators were thriving in the warmth and muck of New York's sewers! But according to Pamela Jones, who wrote a book about New York's underground world, only two three-inch gators were found and both were "pitiful specimens."

For a look at what really lurks in a city's underground, turn the page. ➤



PHOTO: AP/WIDE WORLD PHOTOS

**It was almost "sink or swim" for pedestrians when New York City's Union Square was hit by a water main break.**

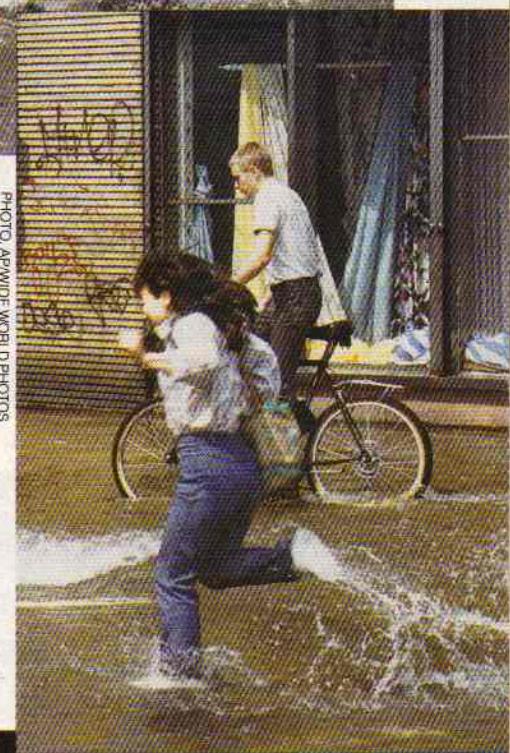
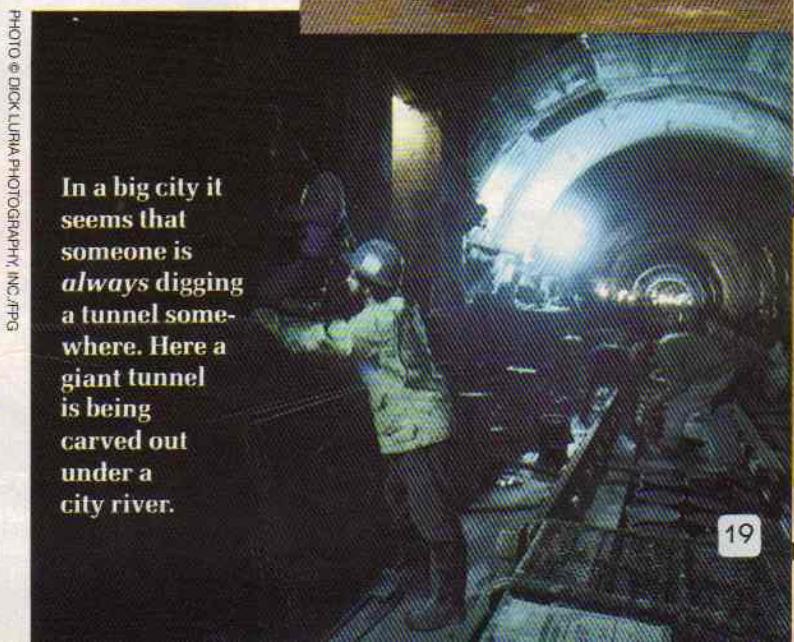


PHOTO: AP/WIDE WORLD PHOTOS



**In a big city it seems that someone is always digging a tunnel somewhere. Here a giant tunnel is being carved out under a city river.**



# PIPE DOWN!

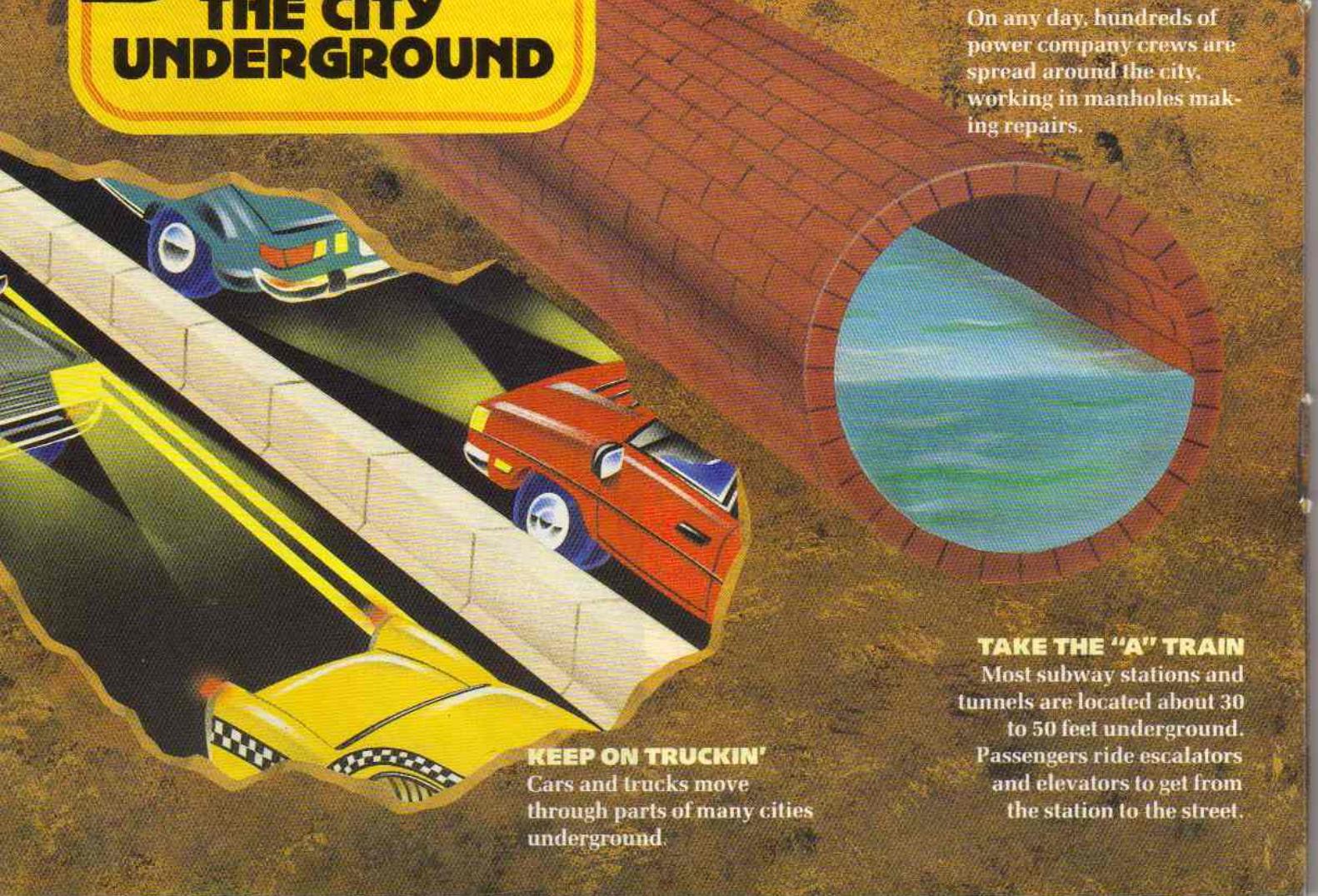
## THE CITY UNDERGROUND

### A MAZE OF PIPES

Closest to the surface are water pipes and steam lines. They are usually laid about four to six feet below the surface.

### DIG WE MUST!

On any day, hundreds of power company crews are spread around the city, working in manholes making repairs.



### KEEP ON TRUCKIN'

Cars and trucks move through parts of many cities underground.

### TAKE THE "A" TRAIN

Most subway stations and tunnels are located about 30 to 50 feet underground. Passengers ride escalators and elevators to get from the station to the street.

### **GAS PIPES**

Gas lines are put in up to 20 feet below the street. They never run closer than 15 feet to a steam pipe to prevent explosions.

### **STORMY WEATHER**

Sewer mains funnel away waste water from households. These pipes run five to 15 feet underground. Below them are bigger storm drains which carry off overflow water from rainstorms.

# THE BLOODHOUND GANG

## The Case of the Hard Hat Heist

By Deeky Cheston



**WOW!** I'd sure like to go to that ground-breaking ceremony tomorrow," said Skip, reading the paper.

"You mean they're finally going to start building Paradise Park?" asked Ricardo. Paradise Park—a kids' center—was the idea of Trevor Danson, head of Danson Development.

"I've got a news flash for you guys," said Vikki. "There might not be a ground-breaking ceremony tomorrow. Trevor Danson is coming to see us this morning."

"What about?" asked Ricardo.

There was a knock at the door. "I guess we're about to find out," said Vikki.

Trevor Danson was upset. "The ground-breaking's off," he said. "Paradise Park has been delayed for months. Somebody's stolen the blueprints!"

### To the Scene of the Crime

Vikki, Skip and Ricardo were going to the construction site in Danson's limousine. "I was going to have the blueprints copied this morning," said Danson.

"That's probably why the thief acted when he did," said Ricardo. "But who would want to steal the blueprints—and why?"

"Only one name comes to mind," said Danson. "B&J Engineering."

"Oh," said Skip. "You mean the guys who are building that new video arcade across town?"

"Right," said Danson. "They're very worried about competition from Paradise Park."

At the construction site a trailer acted as headquarters. It was surrounded by cranes, front loaders, and other heavy equipment. Danson unlocked the trailer as they went in. "Is this door usually locked?" asked Vikki.

"Unfortunately—no," Danson replied. "People are milling in and out of here all the time. And it was raining yesterday, so there were even more people in here than usual."

"This is kind of neat," said Skip to Danson, holding up a star-shaped stone the size of a dime.

"That's not mine," said Danson. "If you want, you can keep it."

"Getting back to business," said Ricardo, "when were the blueprints taken?"

"At about 5 p.m.," Danson replied.

"Just as everyone was leaving," said Vikki—"very convenient."

The Bloodhound Gang looked the office over but found no clues. "Well, it looks as if the police have done their job pretty thoroughly

here. Why don't we move our investigation over to B&J Engineering?" said Skip.

Digging was already underway at the video arcade site, where the bulldozers had unearthed lots of gray, clay-like soil. John Barrett and Kyle Jones of B&J Engineering were in a trailer, drinking coffee. One long desk was covered with maps and a stereo system turned out towards the windows.

"Come on in!" bellowed Jones as Vikki, Skip, Ricardo and Trevor Danson stood in the doorway. "This is our foreman, Matt Farrell," said Barrett.

"Sorry to hear about your misfortune," said Farrell to Danson, as the foreman left the trailer to go back to work.

"Oh yeah," said Barrett. "We're very sorry, right Kyle?"

"We didn't come here for sympathy," said Ricardo. "We came to ask you where you were at about 5 o'clock yesterday evening."

"Right here," replied Jones, "in this very trailer."

"Both of you?" asked Vikki. Barrett and Jones nodded. "Was anybody else here?"

"No," said Barrett. "But I'm pretty sure the whole crew heard us in here. We were having one heck of an argument."

"Well, I guess you two have alibis," said Vikki. "May we question your crew?"

"Be my guest," said Barrett. Outside, the Bloodhound Gang was heading for a group of construction workers when Ricardo suddenly pushed Trevor Danson to the ground.

## Danger on the Rocks

"What the...?" said Danson, lifting his head from the dirt in surprise. A large boulder had tumbled from the mouth of a front loader, missing the man by inches!

Vikki ran towards the front loader. Its operator was already getting out of the driver's seat.

"Matt Farrell!" Vikki exclaimed. "I think you've got some explaining to do."

As Farrell sat solemnly in the trailer, investigators looked over the front loader, trying to determine what had happened. A switch had malfunctioned, causing the front loader to drop its load—in Danson's path. Farrell had not tried

to hurt Danson on purpose.

"I guess you can go back to work now," said Vikki.

"Hey, wait a minute," said Skip. "Those boots are pretty rare, huh?" he asked Farrell.

"Yep," Farrell replied. "They're Starlites." As proof, he held one foot in the air, revealing a star shape carved on the heel.

## A Star for a Clue

**A** "Can I look more closely?" asked Skip. Farrell unlaced his boot and handed it over.

"I don't think we asked you where you were at 5 p.m. yesterday," said Skip.

"Now, wait just a minute," shouted Farrell. "You're not going to pin this on me. I've never been near Danson's construction site!"

"You say you don't know how this ended up in your office?" said Skip to Danson, holding up the small stone star. "Well, I think I can tell you. This star is hardened clay. It was raining yesterday, remember? There's lots of clay around this site—but there's none over at Paradise Park."

"Just what are you getting at?" asked Jones.

"I'm suggesting that yesterday, Farrell's boots were covered with wet, sticky clay. At 5 p.m., long after the rain had stopped, he went into Danson's trailer. By that time, the clay on his boots had hardened, and a small piece of it fell onto the floor." Skip inserted the clay star into the star imprint on Farrell's right boot heel. It was a perfect fit! →





"All right, all right," said Farrell. "I was there yesterday. But it wasn't until 5:30, and those blueprints were already gone."

"Just what were you doing there?" asked Danson.

"I was waiting to meet someone," said Farrell, his face turning red. "I'm dating one of your truck drivers—Emily Bright!"

## Rock Hound to the Rescue

**R**Acting the gracious hosts, Barrett and Jones had ordered pizza and sodas for everyone. While Skip polished off his third slice, Ricardo flipped through some maps, and Vikki snooped around the trailer.

"Don't look so glum, Trevor old boy," said Jones, leaning back in his chair and crossing his legs. As Jones crossed one leg over another, an object fell out of his pants cuff.

"What's this?" asked Ricardo, picking up a small, crystal-like rock.

"That?" Jones replied. "It must be a piece of quartz. There's a lot of it in this area."

"Yes, I know," said Ricardo. "I was just looking over the latest geological survey map. It tells all about where different rock and mineral deposits are located."

"Sharp kid," said Barrett.

"Tell me, Mr. Jones," said Ricardo. "What were you wearing yesterday?"

"These same pants, I guess. Why?"

"I'll show you," said Ricardo. "Got a penny?"

Jones handed a penny to Ricardo, who used the coin to scratch the rock.

"What's the big deal?" said Jones.

"This isn't quartz," said Ricardo. "Quartz can't be scratched even with a sharp steel knife. Calcite, on the other hand, can be scratched with a penny."

"Calcite," said Vikki. "That's the main mineral in limestone and marble."

"And there's plenty of it at the Paradise Park construction site," said Ricardo. "There's none of it here."

"So maybe that's not quartz," said Barrett. "That doesn't prove it's calcite."

"All right," said Ricardo. "I'll do another test. Hand me that bottle of vinegar over there."

Ricardo used a pocket knife to scrape some of the rock into a powder. Then, he poured a drop of vinegar onto the powder. It bubbled rapidly.

"That's calcite, all right," said Ricardo.

"That piece of calcite places you at the Paradise Park site yesterday!" said Vikki to Jones.

"Okay—we stole the blueprints!" Jones whined. "But it was his idea!" He pointed a finger at his partner.

While Barrett and Jones argued, Danson found his blueprints and called the police.

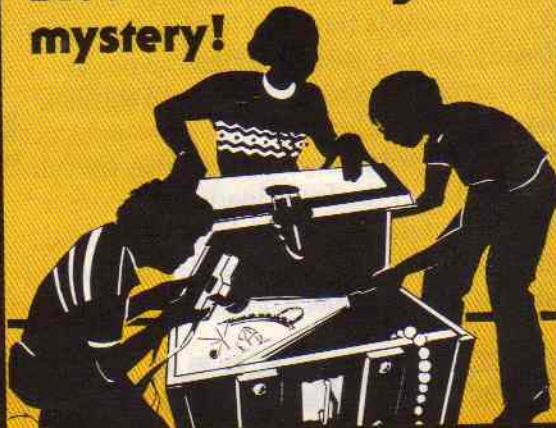
"I've just got one question," said Danson as his competitors were escorted downtown in a police cruiser. "If Barrett and Jones were stealing the blueprints at 5 o'clock, how did everyone hear them arguing in this trailer?"

"The argument was taped," said Skip. "That's why the speakers are turned to the windows."

"Well," said Vikki, "I guess B&J Engineering learned a lesson in geology today."

"Yes," said Ricardo. "It looks like their project is off to a rocky start!" ☺☺

**Watch for next month's  
Bloodhound Gang  
mystery!**



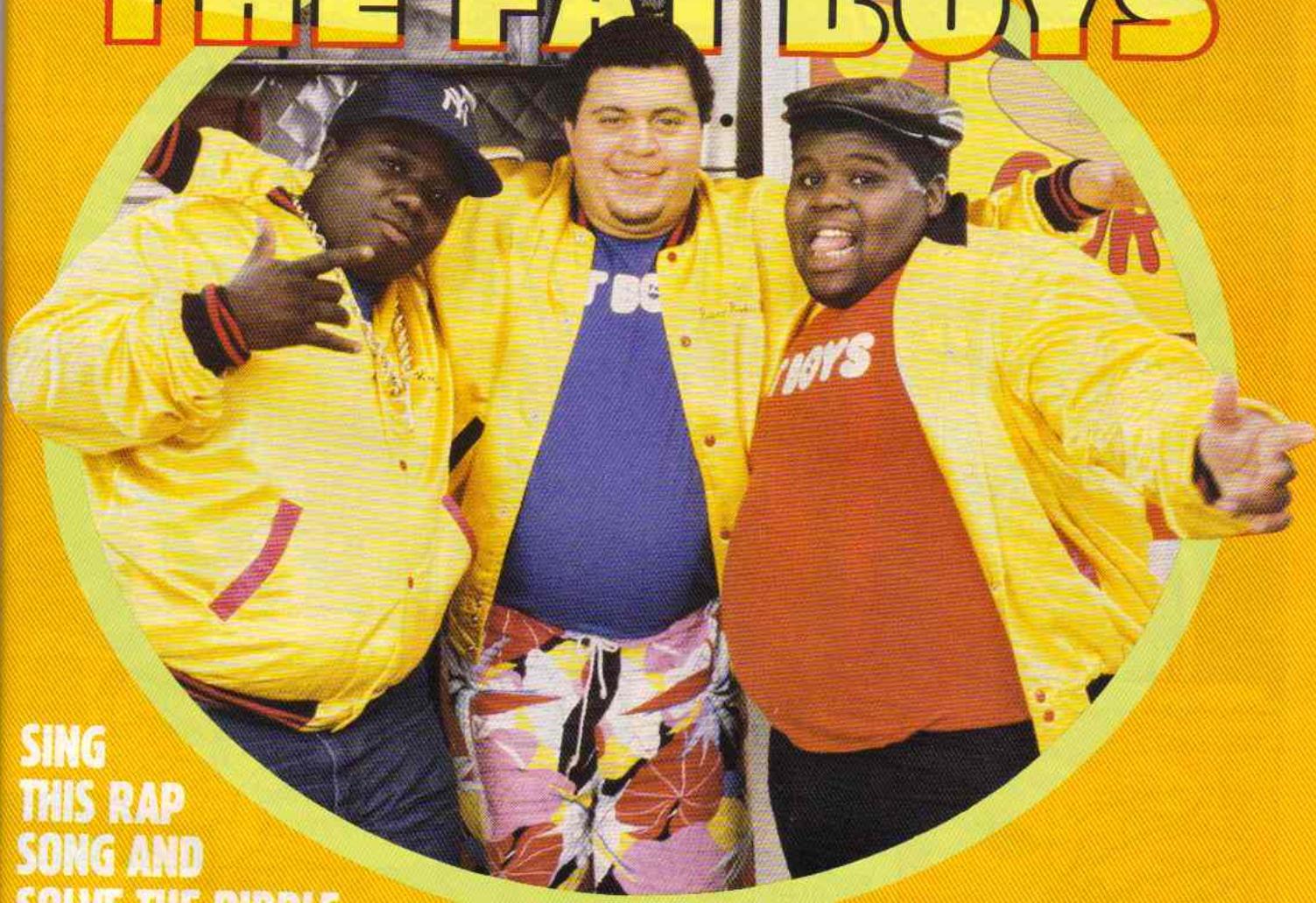
**Special**



**Section**

TUNE IN TO SQUARE ONE TV ON YOUR LOCAL PBS STATION

# THE FAT BOYS



**SING  
THIS RAP  
SONG AND  
SOLVE THE RIDDLE**

We're the Fat Boys here  
With a Square One rap  
And a sneaky little problem you can solve in a snap.

It's a puzzle that we learned  
While we were out on the street—  
We were walking through the city and we wanted to eat.

So we bought **6** pizzas,  
**13** milk shakes,  
**27** enchiladas, **55** cupcakes—

And when we finished eating  
We had cleaned every plate.  
Can you figure out the pattern in the food that we ate?

Did we add it or subtract it?  
Did we multiply?  
Yeah, we're sure that you can get it if you really try.

And when your calculations  
Reach their final stage—  
You can check it with the answers on the DID IT page!

by P.C. Russell Ginns

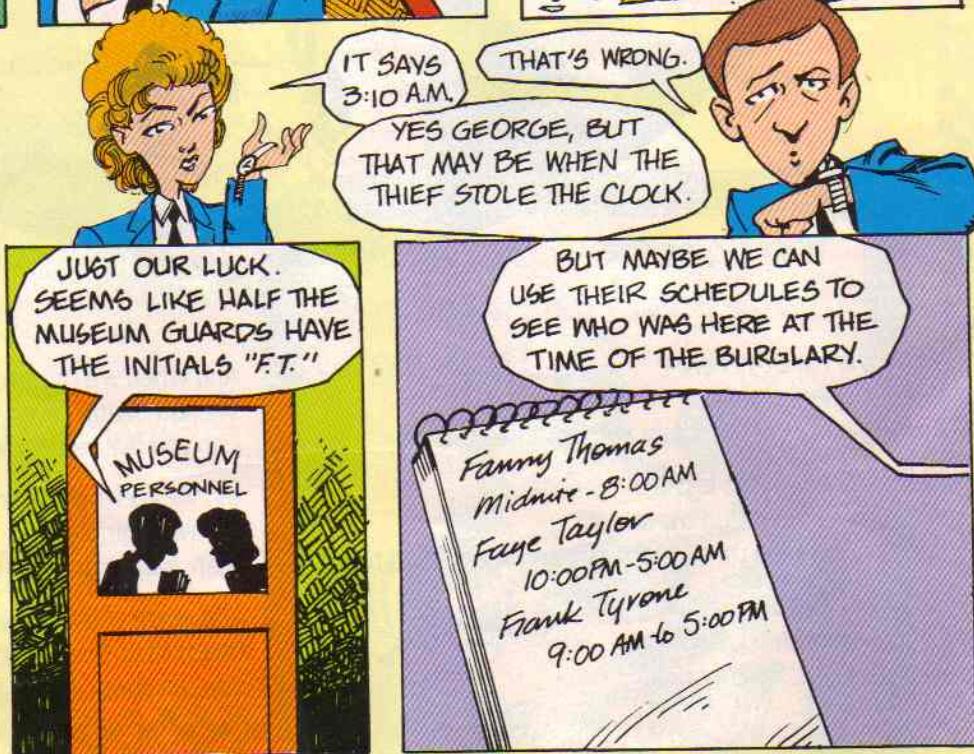
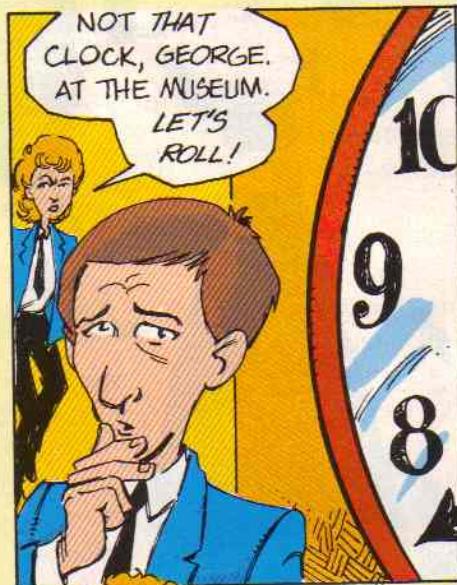
# MATHNET PUZZLE:

## TIME FLIES

STORY: ERIC WEINER ART: KEITH WILSON

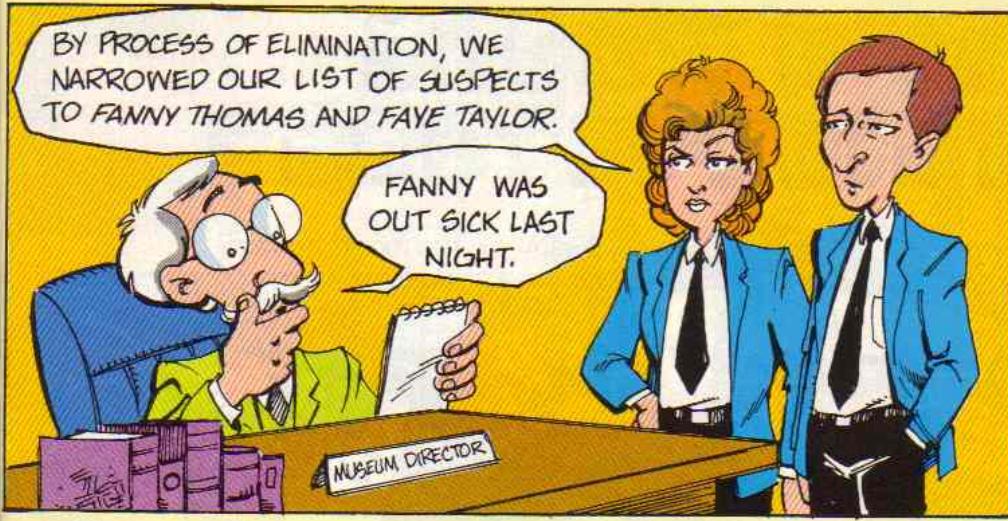
HELP GEORGE AND KATE SOLVE A CRIME!

"I'M KATE MONDAY. I WORK AT MATHNET WITH GEORGE FRANKLY. ONE MONDAY NIGHT A CLOCK WAS STOLEN..."

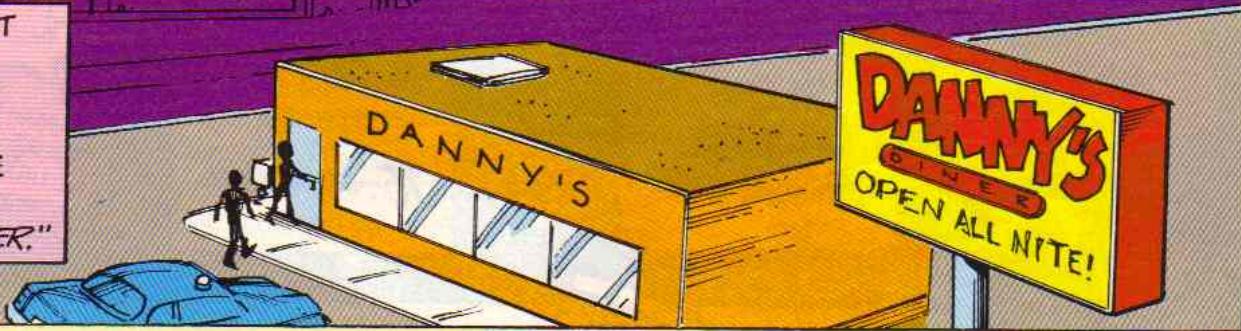


BY PROCESS OF ELIMINATION, WE NARROWED OUR LIST OF SUSPECTS TO FANNY THOMAS AND FAZE TAYLOR.

FANNY WAS OUT SICK LAST NIGHT.



"FAZE WASN'T HOME. HER ROOMMATE TOLD US TO CHECK A DIVE CALLED DANNY'S DINER."



MATHNET... WE'RE LOOKING FOR FAZE TAYLOR.

THIRD BOOTH,  
EATING THE CHEESEBURGER DELUXE, HOLD THE MAYO.

...I EVEN TOOK A PICTURE THAT PROVES IT.



AT 3:10 IN THE MORNING? RIGHT DANNY?

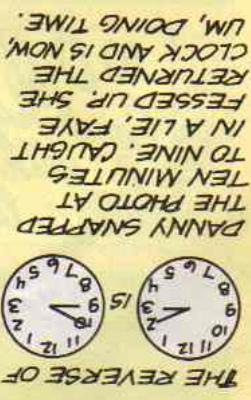
YOU BET FAZE.  
AND NOT ONLY THAT...

NICE PICTURE  
YES, BUT THE CLOCK IS RE-  
FLECTED IN THE MIRROR.



### SOLVE THIS PUZZLE!

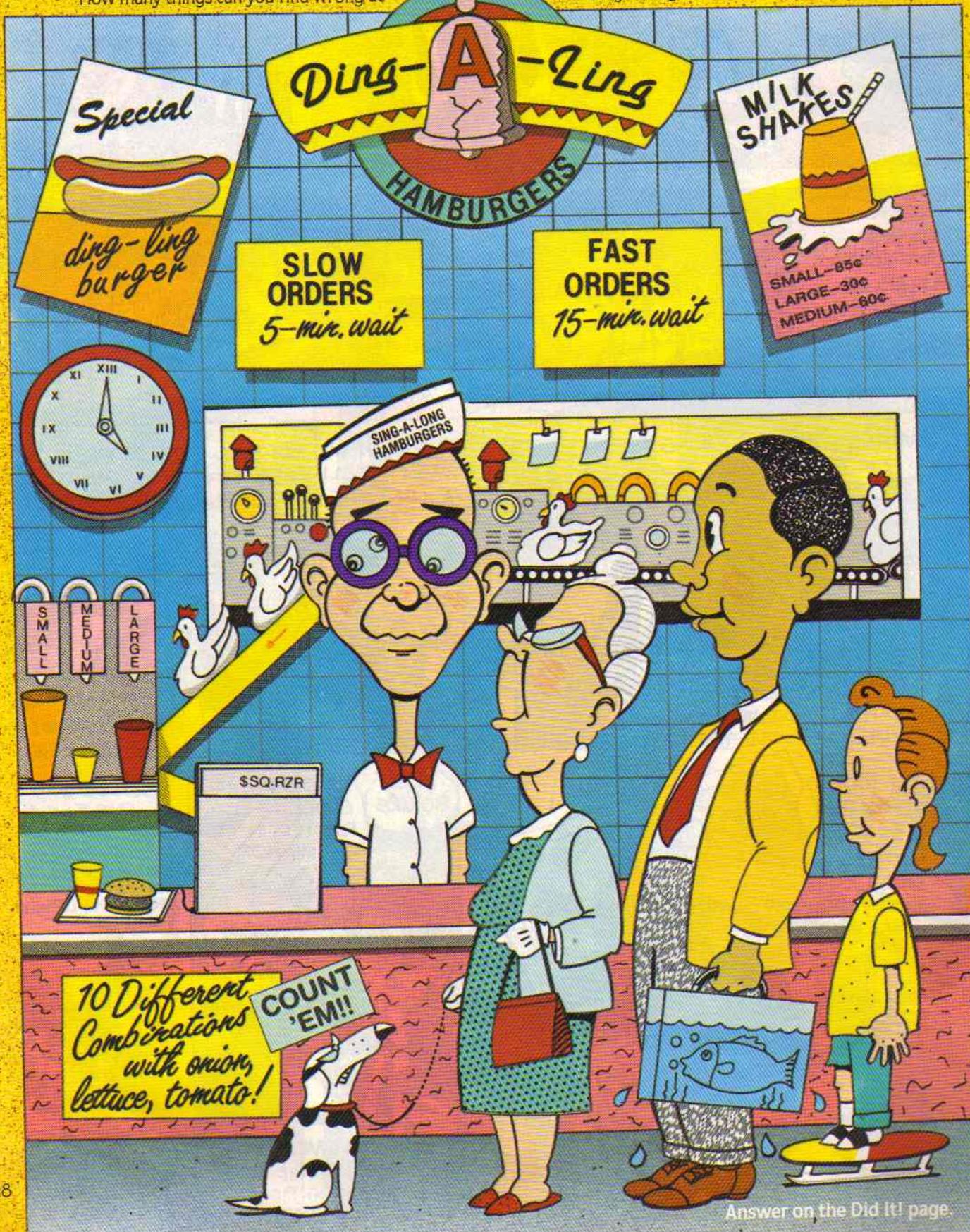
WHEN WAS THE PICTURE REALLY TAKEN? IF YOU'RE STUMPED, TURN THIS PAGE UPSIDE DOWN.



# WHAT'S WRONG WITH THIS PICTURE?

How many things can you find wrong at

the Ding-A-Ling fast-food restaurant?



# BLACKSTONE'S

## Magic Page

**LEARN THIS TRICK AND AMAZE YOUR FRIENDS!**

This trick works like magic—although all it takes is a little mathematics.

You and a friend take turns writing down three-digit numbers. Altogether you write down five three-digit numbers. Then you add them all up. What's the sum total?

The exact number you predicted it would be before you started!

**HERE'S HOW:**

**1.** First, secretly write down your prediction. Predict any four-digit number that starts with the number 2. Set the prediction aside. (We've given you an example to help you along.)

**2,314**—your prediction

**2.** Now, on a fresh piece of paper, write down the last three digits of the number you predicted, plus 2.

**316** (that's the 314 from your prediction plus 2)

**3.** Now it's your friend's turn. Underneath your three-digit number, your friend can write any three-digit number.

**316**  
**729** (your friend's number)

**4.** Now it's your turn. Write a three-digit number that makes each number in your friend's three-digit number add up to 9. (Do the figuring in your head.)

**316**  
**729** (your friend's number)  
**270** (your number)

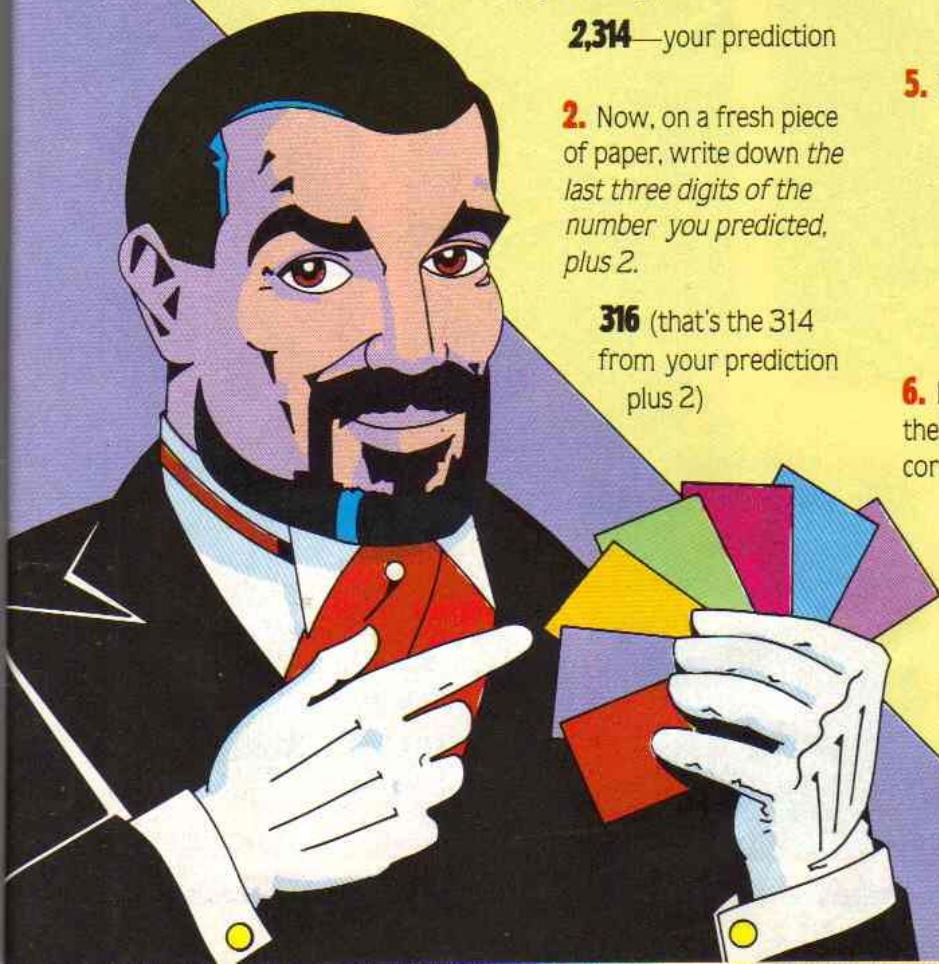
**999** (don't write this down!)

**5.** Repeat steps 3 and 4.

**316**  
**729**  
**270**  
**123** (your friend's next number)  
**876** (your next number)  
**999** (don't write this down!)

**6.** Now add it all up. The sum will always be the number you predicted—if you add correctly! Isn't that sum-thing?

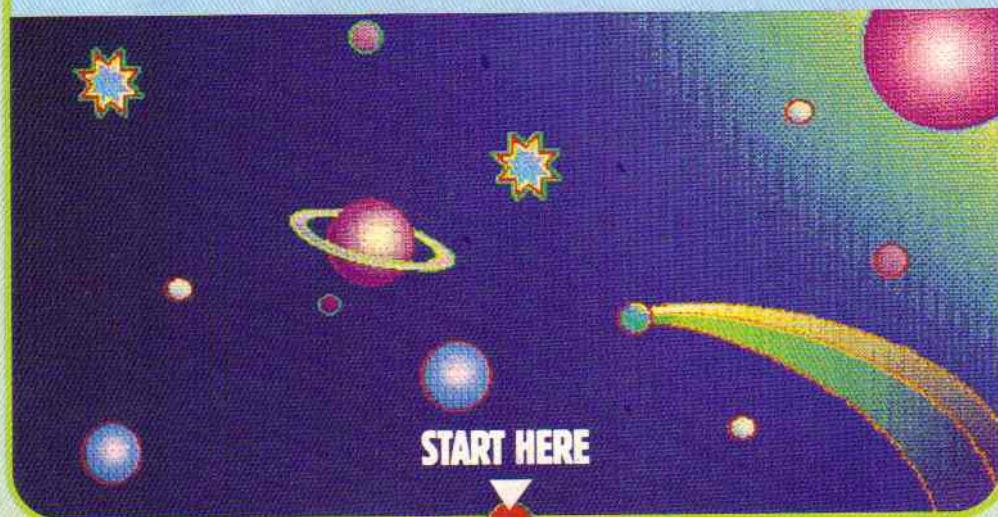
**316**  
**729**  
**270**  
**123**  
**876** +  
**2,314** (your prediction)



William Blaer

YOU'RE RACING ACROSS THE GALAXY IN YOUR X-27<sup>b</sup> STARCruiser  
AND YOU FORGOT TO SLOW DOWN!!

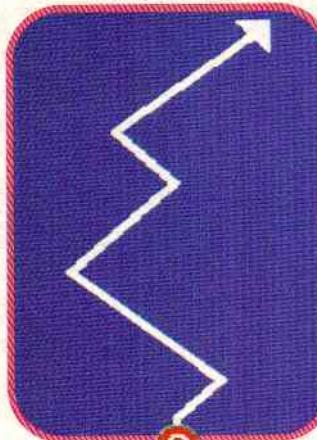
# WHICH BUTTON SHOULD YOU PUSH NOW?!!



by  
P.C. Russell Ginnis



1



2



3



4

Choose the button with  
the path that will keep you  
from crashing into the  
objects on your screen!!



# FIND THE HIDDEN NUMBERS

Go ape over the hidden numbers at the Square One zoo. How many can you find? Answer on the Did It! page.

ILLUSTRATION BY BILL SLOAN





## HITTING THE TOP OF THE CHARTS

By  
Maureen  
Hunter-Bone

Fido has lost the number one slot as the most popular American pet. What animal has replaced the dog as people's best friend? The cat! There are now 56.2 million cats in the U.S. That's 5 million more cats than dogs. This may be a "cat-astrophe" from a dog's point of view, but feline fanciers think it's the cat's meow!

Cats have had some catching up to do. Dogs were the first animals to be tamed. (There were cave dogs about 10,000 years ago.) Cats weren't domesticated—or tamed—until about 3,500 years ago. The first tame cats may have been brought from the African land of Libya to Egypt.

In honor of the cat's new position as top dog, (oops, top cat!), here are some feline facts:

### Would You Do This for Your Cat?

- In Ancient Egypt, cats were treasured for their ability to catch rats and mice and for their graceful looks. Cats were considered sacred. In fact, they were so loved, that when a family's cat died, every member of the family had to shave their eyebrows to show their sadness. Cats were also honored by

being turned into mummies when they died.

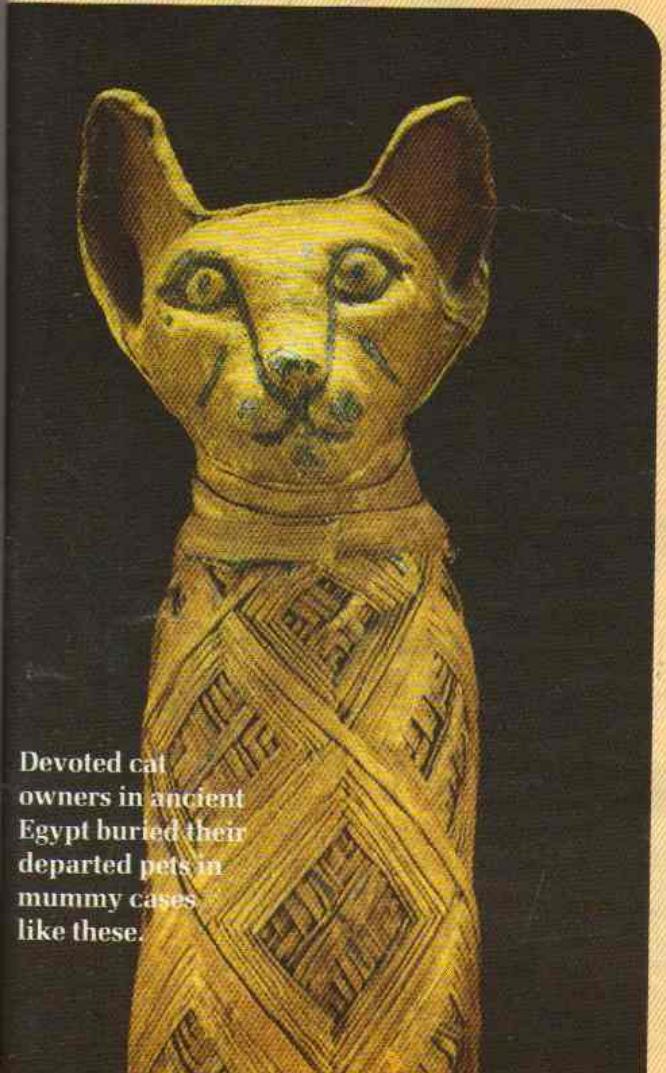
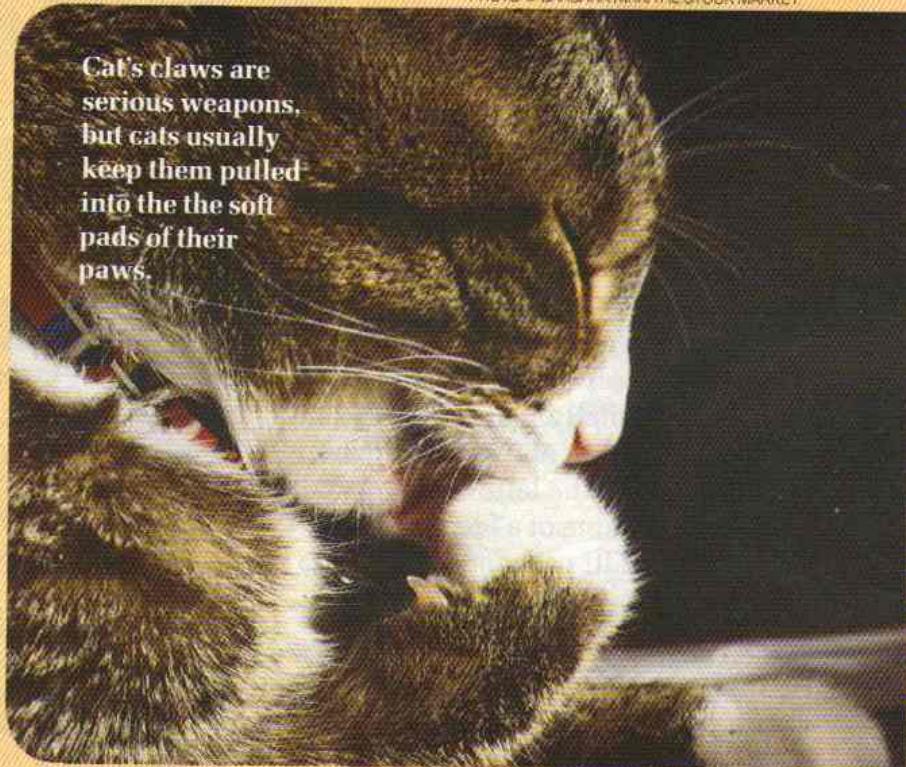
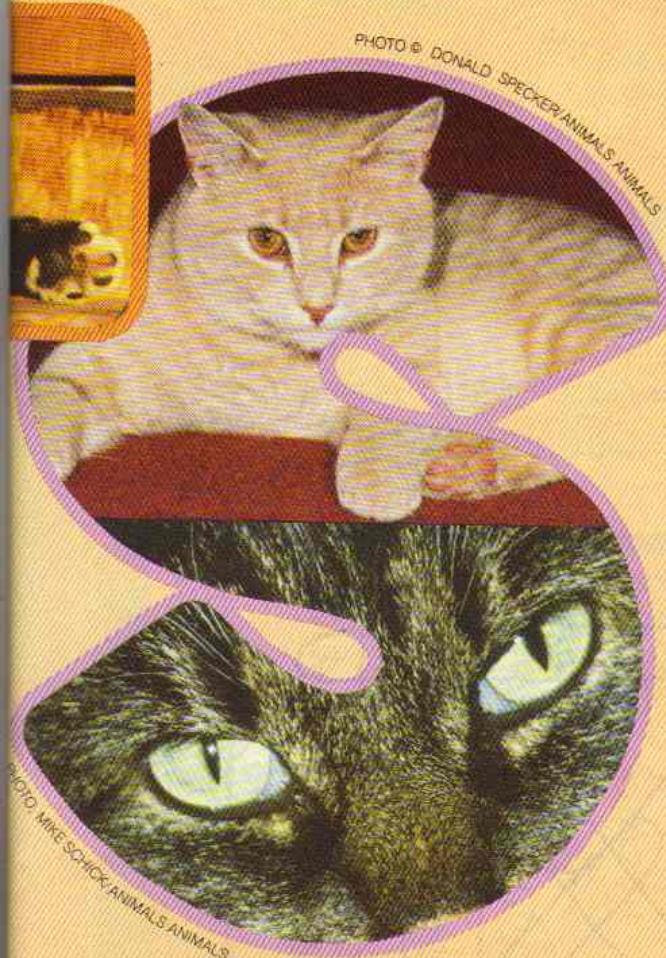
### Feet Feats and Facts

- Will a cat always land on its feet—even if it falls from a great height, or if it is dropped upside down? It's almost true. Many cats have a "righting reflex." If they fall backwards from a tree, they will twist around in the air until they are feet down. Then they'll extend their paws to cushion them as they land.

However, not all cats are this lucky. As they get older and heavier, many cats don't land feet first.

- Most cats have five toes. But, in some places, it is not unusual for a cat to have six—or even seven—toes. Near Boston, Massachusetts, a number of six-toed cats have been found. Six-toed cats have also turned up in parts of Florida. Some towns in New Jersey even have seven-toed cats!

- Why is it that a cat can pad silently on feet that have claws? Why don't they make the clicking sound that dogs' paws make on a bare floor? Unlike dogs, cats can pull their claws into their



**Devoted cat owners in ancient Egypt buried their departed pets in mummy cases like these.**

feet. The claws only stick out when needed for climbing or catching prey.

### The Eyes Have It

- You know the scene: You open a door into a dark room and see the eerie, yellow-green eyes of a cat glowing in the dark. Cats' eyes don't really glow in the dark. This is what happens: Cats have a reflective layer at the back of their eyes. Light that shines on the cat's eyes—for example, from the open doorway—is reflected right back.

- Cats are better at seeing motion than seeing detail. They can spot the movements of small animals, even when the animals are surrounded by a maze of plants and bushes. Cats will wait until they spot a slight movement, then they will pounce. That's why some small animals will go completely stock still in front of a cat. As long as they are absolutely still, the cat may not see them.

So, there they are, the new rulers of the pet world. Cats are stretching, purring and meowing their way into the record books.

# Extra!

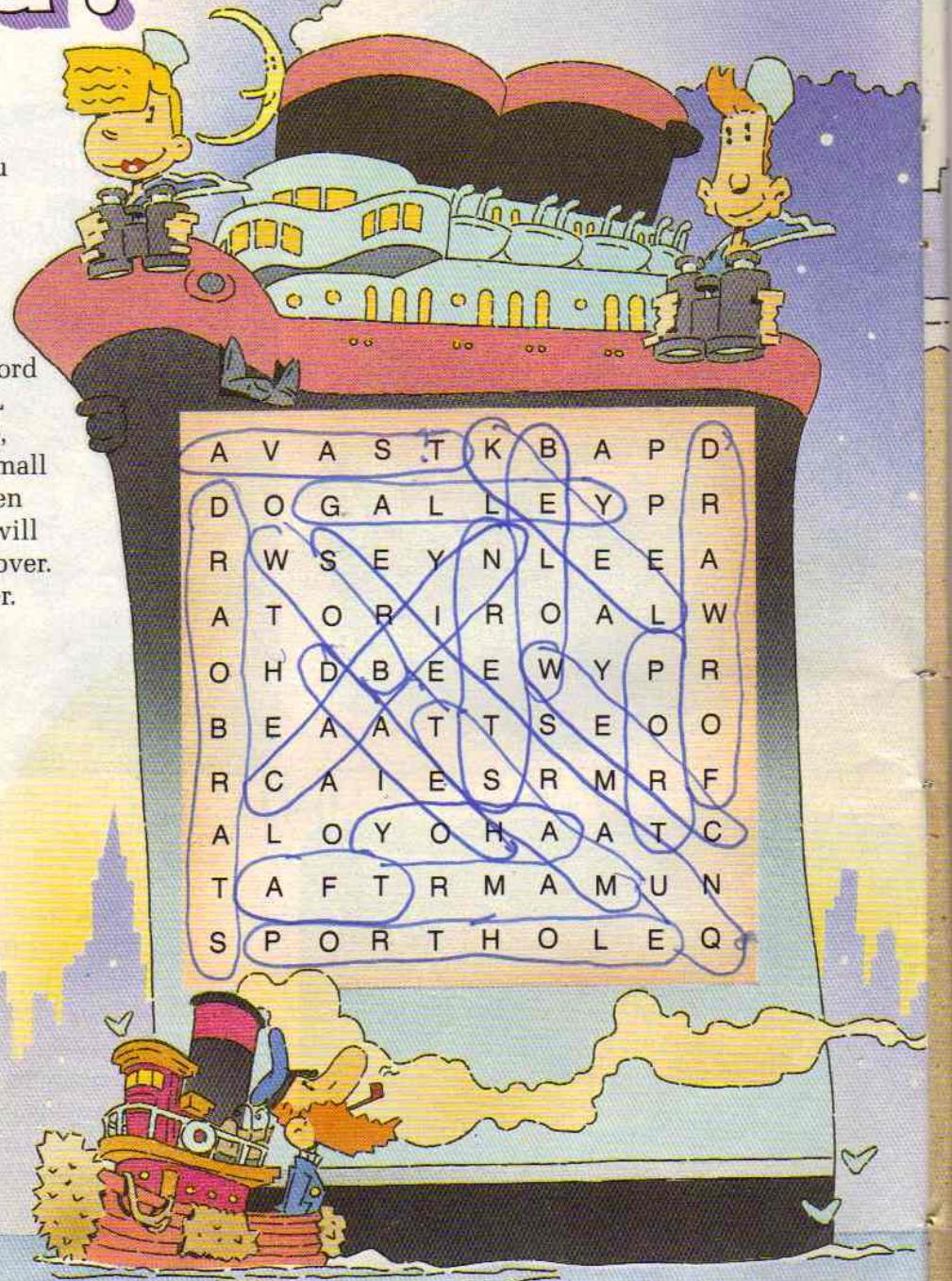
by Ellen R. Mednick

April showers bring May flowers, and this month's EXTRA! brings you loads of pencil fun!

## Sea Search

Here is a list of special words used by sailors. How many of these boating terms can you find in our word search? They're written in CAPITAL letters and go across, backwards, up, down or diagonally. The words in small type explain some of the terms. When you're finished, the leftover letters will spell out the name of a famous sea lover. Check the Did It! page for the answer.

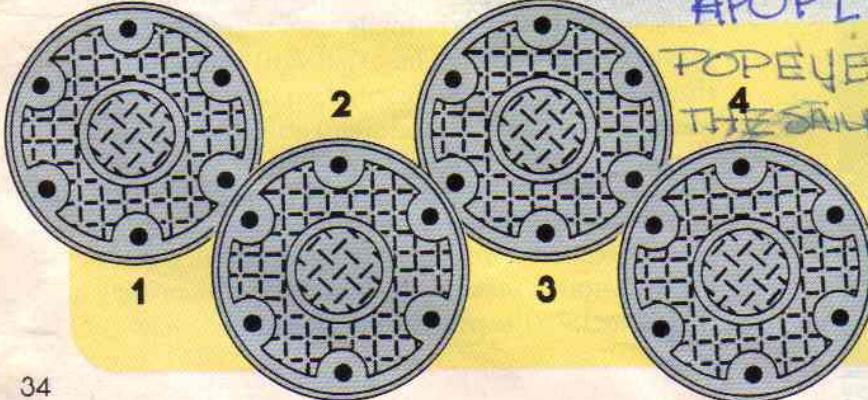
AHOY (hello)  
AVAST (stop)  
QUARTERS (rooms)  
STERN (back of the ship)  
BOW (front of the ship)  
FORWARD (toward the bow)  
AFT (toward the stern)  
PORT (left when you're facing the bow)  
STARBOARD (right when you're facing the bow)  
MAST (pole which holds the sail)  
GALLEY (kitchen)  
BELOW (downstairs)  
CREW  
CABIN  
KEEL (backbone of a boat)  
Porthole (window)  
HEAD (bathroom)  
AYE, AYE MA'aM (Yes, captain—that is if she's a woman captain)



POPEYE TA HUESAIR MLO  
POPEYE THE SAILMAN RMAN

## Manhole Madness

These manhole covers may seem identical, but if you look carefully, you'll find that one is different. Can you spot it? Oh by the way, a manhole cover is usually in the middle of a street. Workers use it to go underground to fix pipes. The answer is on the Did It! page.



## Math Rap

The Fat Boys and Run DMC aren't the only "rappers" around. You can be one, too! Just write your own rap about numbers and math. We'll choose our favorites. The best will receive CONTACT T-shirts.

Send your math raps to:

Raps / 3-2-1 CONTACT Magazine  
1 Lincoln Plaza  
New York, NY 10023

## Alligator Shuttle

Alligators don't really live in the sewers of cities and towns. But in our Extra! city, there's a family called the Alley Gators who

travel by subway. (How else do city gators get around?) Can you help them find their way through the tunnels to the subway station? For an answer, check the Did It! page.



# Basic Training

## Escape From Under The City

What lurks under the city streets? You read about it in *Look Out Below* in this issue. Now you can see for yourself. In this adventure game, you are lost in an underground maze, far below the city's streets. It is dark and wet, and danger could be waiting around the corner. You have one goal in this game: Get out as fast as you can!

All you have to do is run the game and follow the directions. But it helps if you keep a map of where you've been. Start by drawing a box on a piece of paper. That stands for the first tunnel you find yourself in. Then draw in the exits—north and east. As you move from room to room, keep drawing. If you go up or down, start a new map of that level on another piece of paper.

The program is for Apple II computers. To adapt it to IBM machines, change line 840 to read: 840 CLS. For Commodore 64/128 computers, change line 840 to 840 PRINT CHR\$(147).

Don't forget to wear your boots, bring extra batteries for your flashlight and be careful!

### Apple II

```
10  DIM LOC$(2,8),SM$(4),WA$  
(4),EX$(6),E$(3)  
20  FOR X = 1 TO 4  
30  READ A$:SM$(X) = A$  
40  READ A$:WA$(X) = A$  
50  NEXT X  
60  FOR X = 1 TO 6  
70  READ A$:EX$(X) = A$:  
     NEXT X  
80  EN = 0  
90  REM ROOM ONE  
100 W = 1:S = 1:E = 2  
110 E$(1) = EX$(1):E$(2) =  
     EX$(2)  
120 L1$ = "A LONG, DARK  
     TUNNEL."  
130 GOSUB 830  
140 ON C GOTO 160,230  
150 GOTO 90  
160 REM ROOM TWO  
170 S = 2:W = 1:EN = 1  
180 L1$ = "A DARK CAVE"  
190 L2$ = "YOU ARE  
     SURROUNDED BY LARGE  
     RATS"
```

```
200 GOSUB 830  
210 PRINT "YOU COLLAPSE IN  
     FRIGHT!!"  
220 GOTO 780  
230 REM ROOM THREE  
240 W = 1:S = 1:E = 3  
250 E$(1) = EX$(6):E$(2) =  
     EX$(3):E$(3) = EX$(4)  
260 L1$ = "A VERY NARROW  
     SEWER PIPE."  
270 GOSUB 830  
280 ON C GOTO 640,300,90  
290 GOTO 230  
300 REM ROOM 4  
310 W = 2:S = 2:E = 2  
320 L1$ = "AN OLD SUBWAY  
     TUNNEL, BLOCKED AT ONE  
     END."  
330 E$(1) = EX$(1):E$(2) =  
     EX$(6)  
340 GOSUB 830  
350 ON C GOTO 230,370  
360 GOTO 300  
370 REM ROOM 5  
380 W = 2:S = 2:E = 3  
390 L1$ = "A LARGE CAVERN"  
400 E$(1) = EX$(1):E$(2) =  
     EX$(2):E$(3) = EX$(5)  
410 GOSUB 830  
420 ON C GOTO 500,440,90  
430 GOTO 370  
440 REM ROOM 6  
450 W = 3:S = 3:E = 1  
460 L1$ = "A SEWER PIPE,  
     BLOCKED AT ONE END."
```



```

470 E$(1) = EX$(4): GOSUB 830
480 ON C GOTO 370
490 GOTO 440
500 REM ROOM 7
510 W = 3:S = 3:E = 3
520 L1$ = "A SEWER PIPE."
530 E$(1) = EX$(2):E$(2) =
EX$(3):E$(3) = EX$(4)
540 GOSUB 830
550 ON C GOTO 710,370,570
560 GOTO 500
570 REM ROOM 8
580 W = 4:S = 3:EN = 1
590 L1$ = "AN UNDERGROUND
LAKE."
600 L2$ = "A LARGE
ALLIGATOR SMILES AT
YOU"
610 GOSUB 830
620 PRINT "YOU STAY FOR
SUPPER."
630 GOTO 780
640 REM ROOM 9
650 W = 4:S = 4:EN = 1
660 L1$ = "A DEEP PIT."
670 L2$ = "THE LADDER
BREAKS AND YOU CAN'T
GET OUT."

```

```

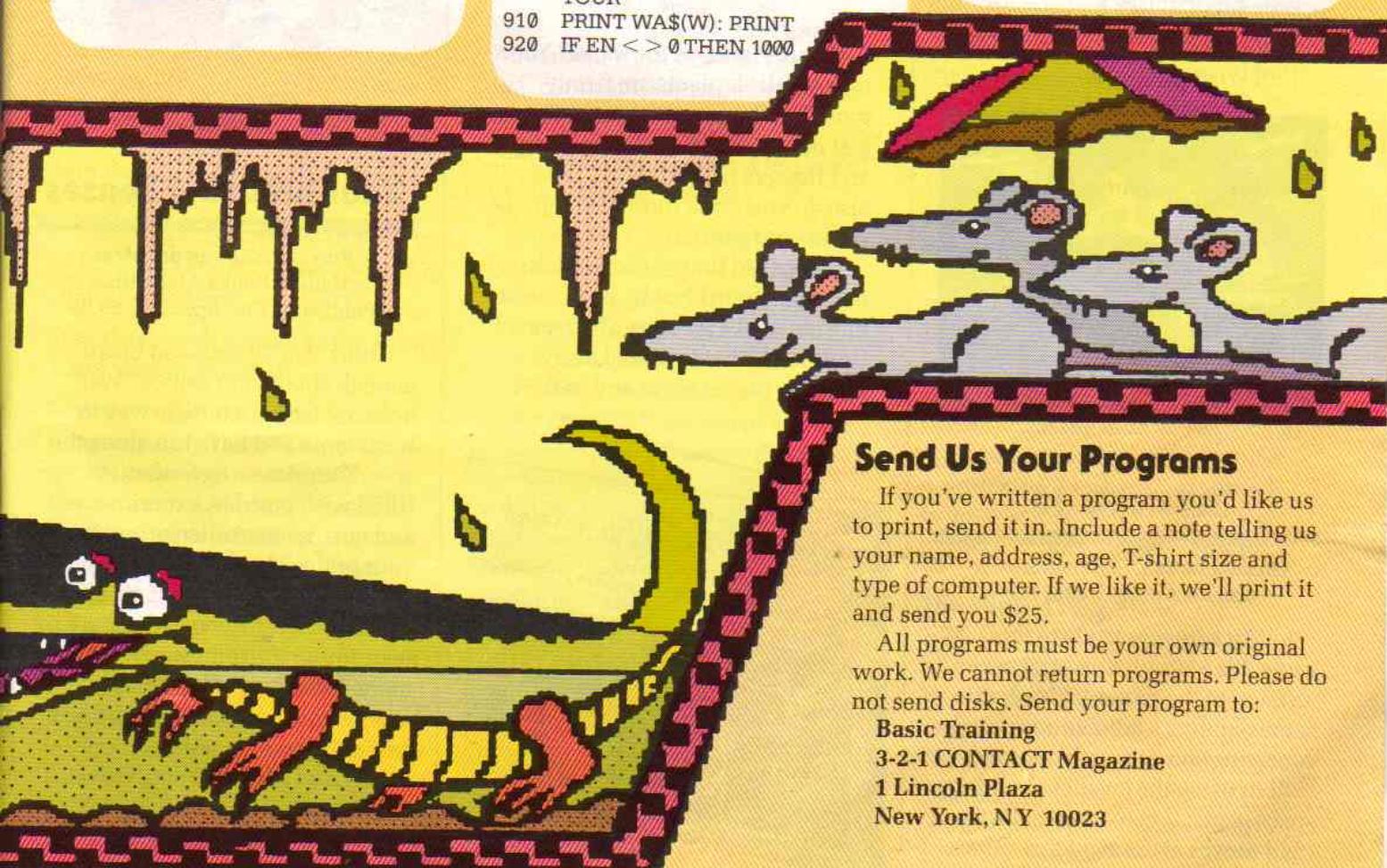
680 GOSUB 830
690 PRINT "YOU'VE BEEN
SLIMED!"
700 GOTO 780
710 REM ROOM 10
720 W = 3:S = 3:EN = 1
730 L1$ = "AN OLD ELEVATOR
SHAFT."
740 L2$ = "YOU SEE LIGHT AT
THE TOP."
750 GOSUB 830
760 PRINT "THERE IS A LADDER
GOING UP."
770 PRINT "YOU MADE IT!!!"
780 PRINT "GAME OVER"
790 PRINT "PLAY AGAIN? Y/N"
800 INPUT A$
810 IF A$ = "Y" THEN 80
820 END
830 REM ROOM DESCRIPTION
HOME
840 PRINT "YOU ARE IN"
850 PRINT L1$
860 PRINT
870 PRINT
880 PRINT "THE SMELL IS"
890 PRINT SM$(S): PRINT
900 PRINT "THE WATER IS UP TO
YOUR"
910 PRINT WA$(W): PRINT
920 IF EN < > 0 THEN 1000

```

```

930 PRINT "WITH YOUR
FLASHLIGHT, YOU SEE"
940 PRINT "THESE EXITS:"
950 FOR X = 1 TO E
960 PRINT X;" ";E$(X)
970 NEXT X
980 PRINT "CHOOSE ONE BY
NUMBER"
990 INPUT C
1000 PRINT L2$
1010 PRINT : RETURN
1020 DATA VERY BAD, ANKLES,
HORRIBLE, KNEES
1030 DATA DISGUSTING, WAIST,
OVERPOWERING, NECK
1040 DATA A TUNNEL GOING
NORTH
1050 DATA A TUNNEL GOING
EAST
1060 DATA A TUNNEL GOING
SOUTH
1070 DATA A TUNNEL GOING
WEST
1080 DATA A LADDER GOING UP
1090 DATA A LADDER GOING
DOWN

```



## Send Us Your Programs

If you've written a program you'd like us to print, send it in. Include a note telling us your name, address, age, T-shirt size and type of computer. If we like it, we'll print it and send you \$25.

All programs must be your own original work. We cannot return programs. Please do not send disks. Send your program to:

### Basic Training

3-2-1 CONTACT Magazine  
1 Lincoln Plaza  
New York, N.Y. 10023

# Reviews

## Software

### Project Space Station

(Avantage, \$35, Commodore 64; also for Apple and IBM)

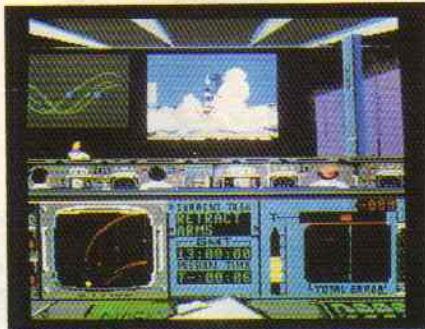
If you're a joystick jockey, this game isn't for you. But if you want the thrill of running your own space shuttle mission, then try your hand at Project Space Station.

You play the part of mission commander, making all the decisions. The success or failure of the mission is up to you.

Although this is mostly a thinking game rather than an action one, there is still plenty of excitement. There are also nice color graphics which show all the different stages of your space mission.

Great for the whole family, though it might be a bit difficult for younger kids.

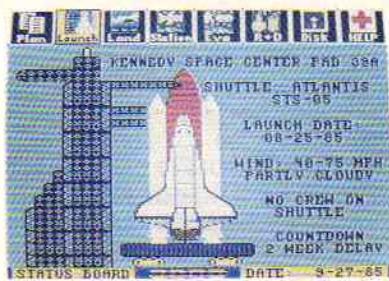
—Phil Wiswell



### APOLLO 18

(Accolade, \$35, Commodore 64; also for Apple II, IBM PC)

Joystick lovers will love this game. It's a simulation of a space mission to the moon. Though this game requires a lot of thought and concentration, it mostly requires skill in using the joystick. In this space game, if you don't make the right moves at the right time, the



mission will fail.

Apollo 18 has a lot of action. It's just plain fun.

—P.W.

## Books

### SEEDS Pop-Stick-Glide

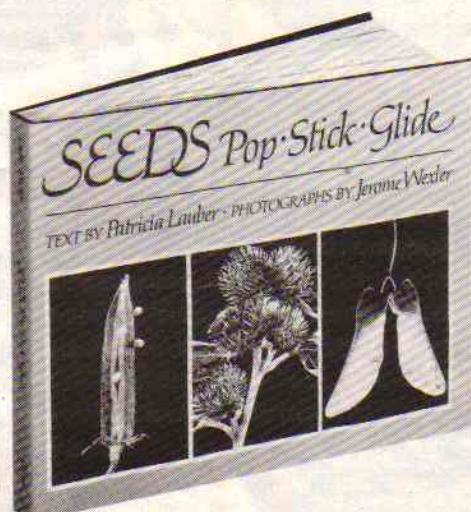
By Patricia Lauber

Photographs by Jerome Wexler  
Crown Publishers, Inc. New York

\$4.95

What? Plants on the move? You may think all plants are firmly rooted in the ground, but that's just not so. There are many plants and flowers that do travel. How else do you think those dandelions got in your garden?

Where did these new dandelions come from? Not by jet plane or bicycle, that's for sure. They grew from seeds that travelled away from the parent plant and took



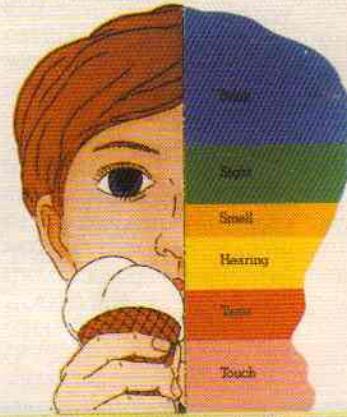
root in a new place.

Through a collection of black and white photographs, Seeds Pop-Stick-Glide explores how seeds from plants travel with animals, people, wind, water or just by themselves.

—Antonella Severo

### Your Amazing Senses

36 Games, Puzzles, and Tricks That Show How Your Senses Work



Ron and Atie van der Meer

### Your Amazing Senses

Ron and Atie van der Meer  
Aladdin Books, Macmillan Publishing Co, New York, \$9.95

Think you've seen and heard enough about your senses? Wait, hold on! Here's a terrific way to learn more and have fun along the way. Your Amazing Senses is filled with puzzles, experiments and quizzes to challenge and tease your brain. There are even 3-D glasses, scratch and sniff stickers, and optical illusions to make learning about your senses even more interesting.

After you've tried all the games and quizzes—try testing your family and friends. You'll drive them absolutely—senseless!

—Ellen Rudolph Mednick

# The Slipped Disk Show

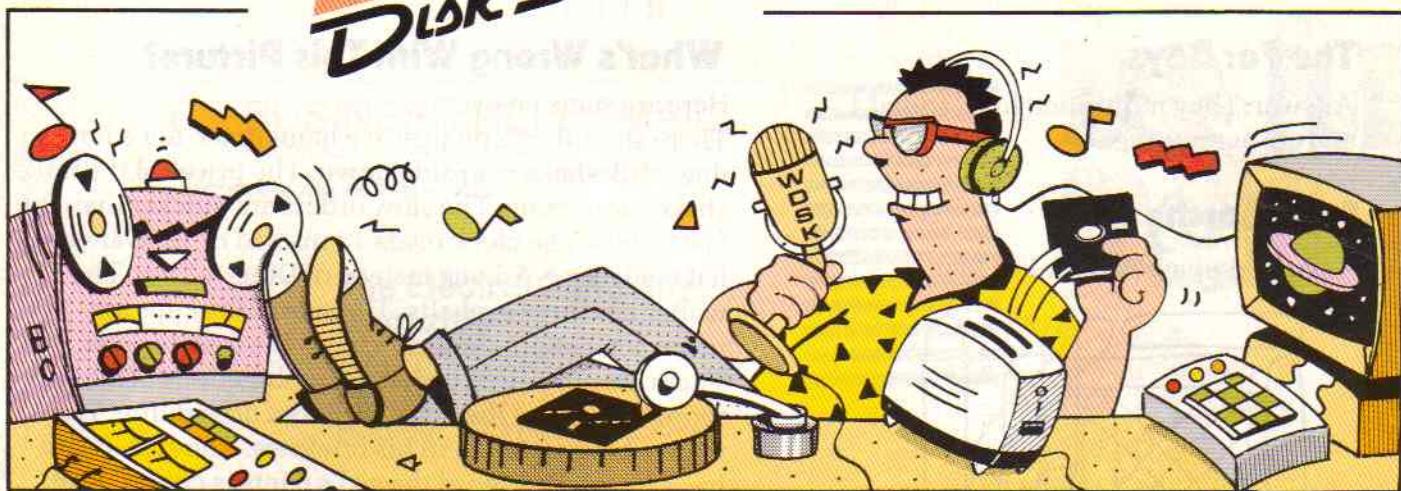


ILLUSTRATION BY CAMERON EAGLE

Hi, there, happy hackers! Welcome to the Slipped Disk Show, the computer advice column that every month asks the musical question, "If life is but a dream, is it in color or black and white?"

Speaking of dreams, the other night I had a dream that I was my dog, Floppy. It wasn't so bad, except I kept trying to answer questions about important computer-type stuff and all I could do was bark! The worst part was everybody said they were the best answers I ever gave.

Speaking of questions, Doris Woo of Indianapolis, Indiana, sent one in that goes like this:

### Was there such a thing as the Apple I and who invented it?

Woof! Woof! Does that answer your question, Doris? I didn't think so. Well, the real answer is yes, there was an Apple I. Of course, at the time it was just called the Apple.

The Apple computer was invented by computer engineer Steve Wozniak in 1975. He and his friend Steve Jobs decided to go into business for themselves. So they began to build their computers in a garage. The first Apple sold for \$660. In 1977, the two men built the Apple II, which had some impor-

tant improvements, like a screen and a keyboard. Within a few years, Apple was one of the biggest computer companies in the United States.

Speaking of twos, this next question was sent in by two different readers: **Sarah Wilkes**, 10, of West Hills, California, and **Carrie Anderson**, 10, of Seattle, Washington. Sarah and Carrie both want to know:

### Why aren't the keys on a keyboard in alphabetical order?

Sarah and Carrie, would you believe they were in alphabetical order until somebody dropped them and they got all mixed up? No? I didn't think so.

The keys on typewriter and computer keyboards are not in alphabetical order because we don't use the letters of the alphabet in order. For example, E comes after B in the alphabet, but we use the letter E a lot more than we use the letter B.

The best arrangement for a keyboard puts the letters we use most in the middle row. This kind of keyboard is called the Dvorak keyboard after the man who invented it. However, and this is the tricky part, most computers and typewriters don't use the Dvorak keyboard. Why not? Because when the

first typewriters were built, typists were typing faster than the keys could move and the keys got jammed. So believe it or not, the keyboard we use today was invented to slow typists down!

Let's speed up and answer one more question. It's from **Ben Kuper** of Monument, Colorado, who asks:

### "What are users' groups?"

Ben, users' groups are computer clubs where computer users get together to swap ideas and to find out about the latest in software and equipment. Usually, a users' group is for owners of one brand of computer, say Apple II users or IBM PC fans. A lot of schools have computer clubs—a good way to meet other computer fans.

And speaking of fans, I expect all my fans to send in their computer questions. I'll be back next month to answer them (and I promise not to bark). Send your questions to:

**The Slipped Disk Show**  
3-2-1 CONTACT Magazine  
1 Lincoln Plaza  
New York, NY 10023  
See you next month!  
Woof! Woof!

Floppy the computer canine never dreams he is Slipped Disk.

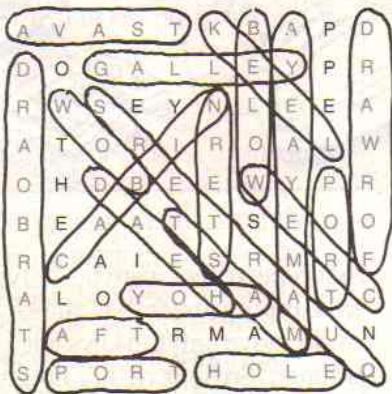
# Did It!

## The Fat Boys

Answer: They multiplied by 2, added 1, and ate everything.

## Sea Search

Answer: Popeye, The Sailor Man

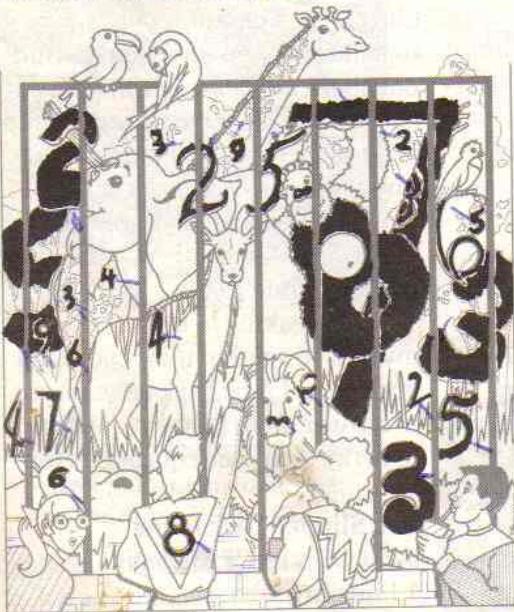


## Manhole Madness

Answer: Manhole Cover #2

## Find the Hidden Numbers

Here are some answers:



## Which Button Should You Push Now?

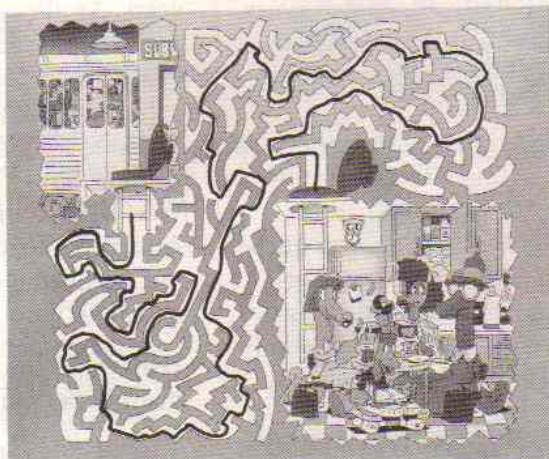
Answer: Button 3

## What's Wrong With This Picture?

Here are some answers:

There should be a picture of a hamburger, not a hot dog. Milk shake is upside down. The prices of the milk shakes are wrong. The slow orders are quicker than the fast orders. The clock reads 13 instead of 12. Waiter's hat reads Sing-A-Long instead of Ding-A-Ling. The waiter has three eyeballs. The size of the cups are incorrect. Letters shouldn't be on the cash register. There are only eight different combinations of burger toppings. Part of the dog's leash is a dotted line. The man is holding a fish in his briefcase. The skateboard has a blade. One leg of the girl's pants is cut off. And what are those chickens doing there, anyway?

## Alligator Shuttle



## Next Month!

Here's a look at some of the exciting stories in June's 3-2-1 CONTACT:

### Brothers and Sisters?

Did you ever wish your brother or sister would move far away? Do you ever fight? Then this feature may help you get along better!

### The Animal Man

Meet a man who raises endangered animals in his own private zoo.

and much, much more.

# Put the right magazine in your child's hands...

and watch the fun and learning begin!

**SESAME STREET MAG**  
GET READY FOR SCHOOL!  
PLUS: 30-PAGE PARENT'S GUIDE!  
Big Bird, Bert and Ernie, Grover and all the other "folks" keep your preschooler entertained for hours! Ten terrific times a year for just \$12.97.

**PRE School**  
ages 2 through 6

**SESAME STREET MAGAZINE**  
From the TV show that revolutionized learning—Big Bird, Bert and Ernie, Grover and all the other "folks" keep your preschooler entertained for hours! Ten terrific times a year for just \$12.97.

**ELECTRIC COMPANY**  
Amazing America  
Philadelphia Niagara Falls Williamsburg  
More places to visit inside!  
ages **6 to 10**

**ELECTRIC COMPANY MAGAZINE**  
Makes reading, language skills and learning fun. Educates and entertains through stories, puzzles, word games, projects and features. Perfect for Sesame Street Graduates! Ten issues for just \$11.97.

**3-2-1 Contact**  
GIRLS OR BOYS WHO'S STRONGER? WHO'S SMARTER?  
Also Inside:  
• Mystery of the Ancient Stones  
• Funny Farms  
• 3-2-1 Computer Section  
ages **8 to 14**

**3-2-1 CONTACT MAGAZINE**  
Award winning articles about Nature, Science and Technology. Each issue is packed with puzzles, projects, and challenging Square One TV math pages...All designed to help your child learn while having fun. Ten issues for just \$13.97.

Your kid will love it!  
Just return the order card of your choice...TODAY!

# Come face to face with new friends like these every month.



Discover the hidden secrets of the world's most incredible animals with the *Illustrated Wildlife Treasury*.

A bird that actually *paints* his house! A small mammal that avoids attack by *playing dead!* A fish that *shoots* bugs out of the air with his own built-in *water pistol!*\*

You'll discover these and hundreds of other fascinating animals in the *Illustrated Wildlife Treasury*. With hundreds of Wildlife Cards and a special carrying case, you'll learn about fish, reptiles, dinosaurs, jungle animals and more. And each card has a full-color photo, along with great stories and facts about the animal.

It's a terrific way to learn about animals that will amaze you and your friends. And, if you order now, you'll get over \$15 in free gifts!

## Free gifts to start.

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